MARCH 7, 1955

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

What Price Annual Wage, Mr. Reuther?

GAW could limit expansion and growth, halt march toward higher living standards

—page 59

CONTENTS — PAGE 5

Metalworking in the West—Special Section, P. 101

PROGRESS REPORT

To Tubing Users

from Babcock & Wilcox

ALLIANCE

BEAVER FALLS

MILWAUKEE

In order to better serve tubing users B&W has steadily expanded its range of tubular products, over a period of several years, until today the Company offers a selection of seamless and welded carbon, alloy and stainless steel tubing to meet virtually all pressure and mechanical tubing requirements. In types, grades, sizes, lengths and finishes the tubing buyer may choose from literally millions of combinations.

B&W plants at Beaver Falls, Pennsylvania, and Alliance, Ohio, manufacture hot-finished, cold-drawn and roto-rocked tubing on modern equipment which has been constantly improved or enlarged to better serve tubing users.

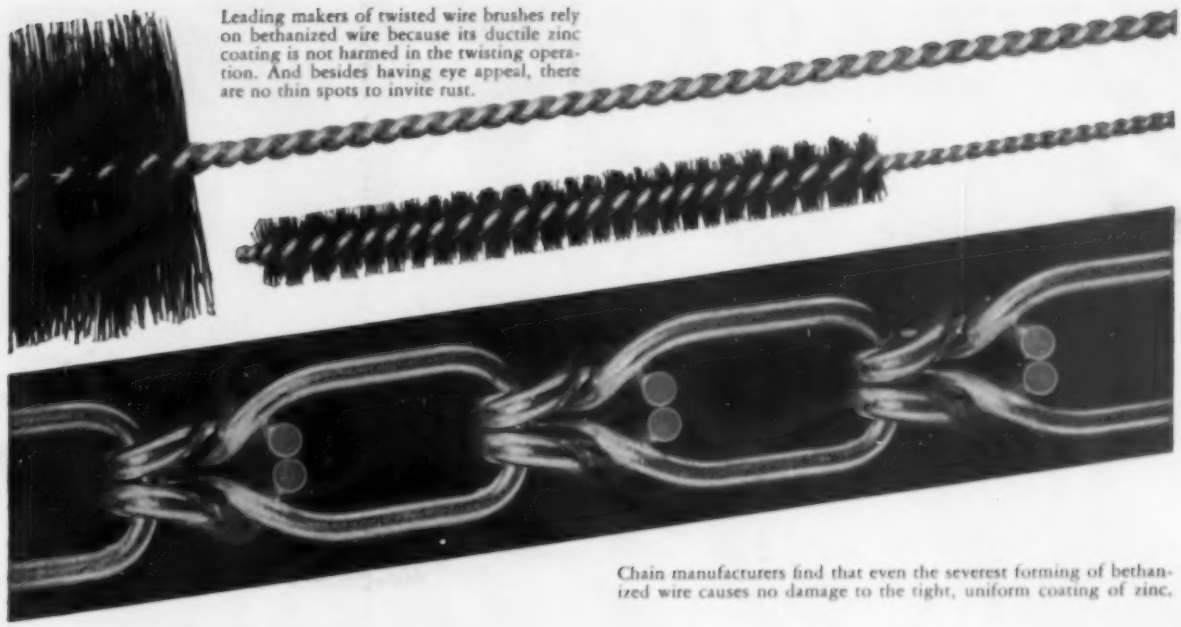
To further diversify, B&W now operates a third tubular products plant at Milwaukee, Wisconsin. This mill manufactures mechanical and pressure tubing of stainless, alloy and carbon steel grades in a broad range of sizes. In addition it produces tubing of low carbon ingot iron, aircraft tubing, tubing of special shape cross sections as well as a variety of seamless welding fittings.

As always, B&W is dedicated to the high quality standards in the manufacture of tubing and pipe which have earned for B&W tubular products an outstanding reputation and the continued confidence of its customer friends.

B&W SEAMLESS and WELDED TUBES

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa. and Milwaukee, Wis.: Seamless Tubing, Welded Stainless Steel Tubing
Alliance, Ohio: Welded Carbon Steel Tubing
Milwaukee, Wis.: Seamless Welding Fittings

TA-5001(G)



Leading makers of twisted wire brushes rely on bethanized wire because its ductile zinc coating is not harmed in the twisting operation. And besides having eye appeal, there are no thin spots to invite rust.

Chain manufacturers find that even the severest forming of bethanized wire causes no damage to the tight, uniform coating of zinc.

Pure zinc . . . perfectly bonded to steel . . . that's bethanized wire

What sets bethanized wire apart, above any other feature, is the perfect bond between the pure zinc coating and the steel base. As the wire goes through the bethanizing process, pure zinc is electrolytically deposited on the steel, atom by atom, building up a tight, uniform protective armor.

That is why bethanized wire is hard to beat for corrosion-resistance. The zinc coating is so even that there are no thin spots where corrosion can find a foothold, and so ductile that it goes through severe forming and fabrication without damage.

The sparkle of pure zinc adds eye-appeal to wire products. Now is a good time to see what bethanized wire can do for you. Either light or heavy coating weights can be supplied in hard- or soft-temper wire. Our nearest sales office will give you complete information.

Here's an easy way to judge bethanized wire for yourself . . . let us mail you a small sample piece. You can twist it, bend it, wrap it around its own diameter—even draw it through dies—and the ductile zinc won't crack or peel off.

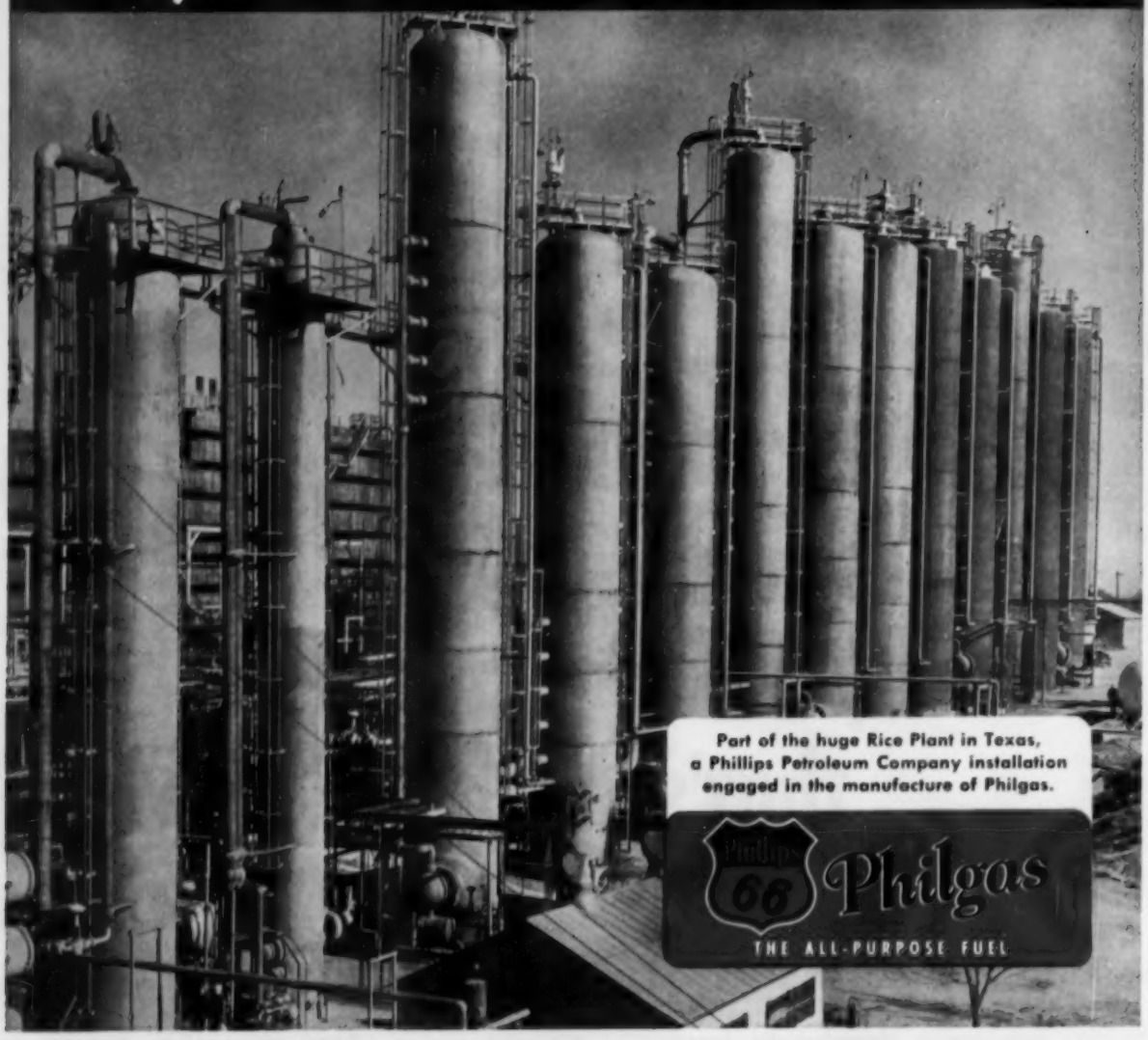
Write now for your sample. Address your request to Bethlehem Steel Co., Room 1037, Bethlehem, Pa. If you want enough bethanized wire for a production test, our Sales Department will gladly make arrangements to send you a trial order of the proper gage, temper, and coating weight.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

*Philgas** IS AMERICA'S LARGEST SELLING LP-GAS



Part of the huge Rice Plant in Texas, a Phillips Petroleum Company installation engaged in the manufacture of Philgas.

PHILLIPS MODERN MANUFACTURING AND STORAGE FACILITIES ASSURE YOU A HIGH QUALITY PRODUCT

● Phillips modern facilities and strict standards of production are your assurance of the purity, uniformity and high thermal value of Philgas. Phillips vast storage capacity helps assure you of dependable, year-around supply. Phillips also maintains its own fleet of tank cars and trucks to provide prompt deliveries.

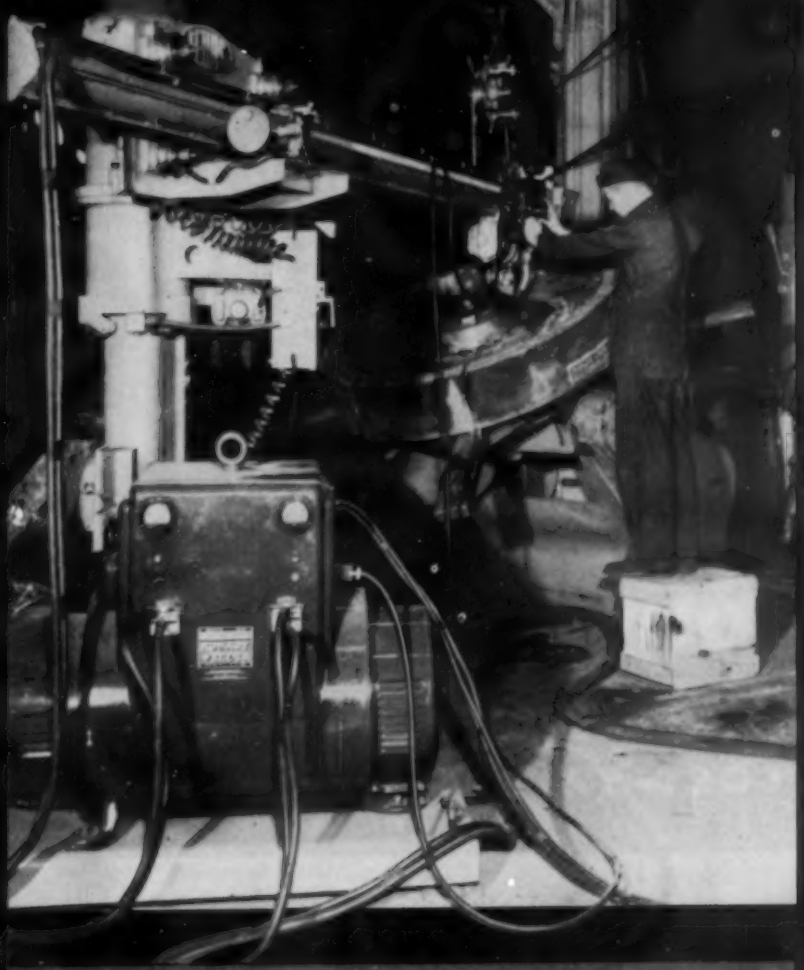
Philgas is a clean-burning LP-Gas with uniform thermal values and gravity. It is free from harmful contaminants. With Philgas you can have automatic systems with constant, easily controlled operations. Write for information. Find out why many leading industries are using Philgas to turn out better products and, at the same time, cut operating expenses.

*Philgas is the Phillips Petroleum Company trademark for its high quality propane-butane LP-Gas or bottled gas.

PHILLIPS PETROLEUM COMPANY

Sales Department · Bartlesville, Oklahoma

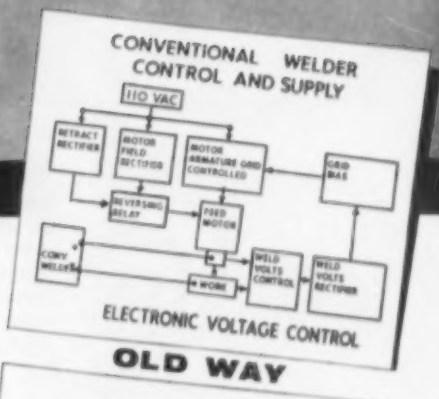
Offices located in Amarillo, Tex., Atlanta, Ga., Chicago, Ill., Denver, Colo., Des Moines, Ia., Indianapolis, Ind., Kansas City, Mo., Minneapolis, Minn., New York, N. Y., Omaha, Nebr., Raleigh, N. C., St. Louis, Mo., Tampa, Fla., Tulsa, Okla., Wichita, Kans.



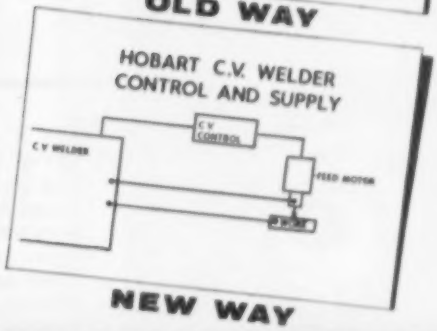
Industry is taking to the NEW *Simplified* HOBART AUTOMATIC WELDING by storm

HERE'S WHY!

• IT'S SIMPLIFIED • IT'S EASY TO INSTALL AND USE • IT'S FLEXIBLE TO FIT THE JOB • IT ELIMINATES COSTLY, TROUBLESOME MAINTENANCE AND DOWNTIME • IT SPEEDS OPERATIONS AND LOWERS PRODUCTION COSTS • IT ELIMINATES COMPLICATED ELECTRONIC AND ELECTRICAL CONTROLS



OLD WAY



NEW WAY

HOBART BROTHERS COMPANY

Box ST-35, Troy, Ohio, Phone 21223

"One of the world's largest builders of arc welders, electrodes and accessories"

200 to 600 amp. Electric Drives

200 to 600 amp. Gas Drives

250 amp. Gas Drive

180-500 amp. Transformers

INVESTIGATE... see for yourself!

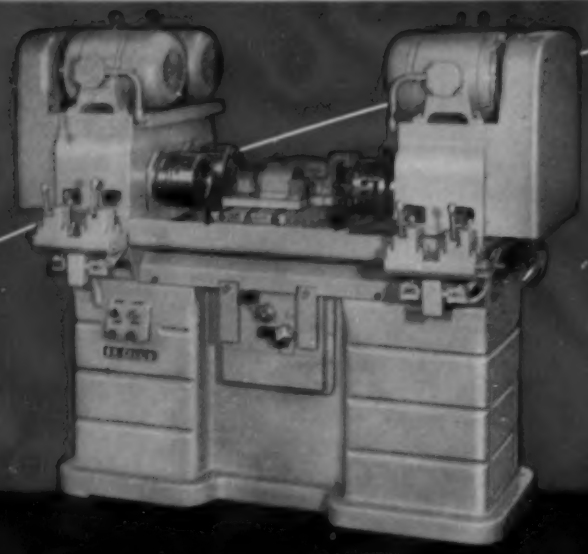
HOBART BROTHERS CO., Box ST-35, Troy, O., Ph. 21223
Without obligation, please send me complete information on items checked below.

☐ 400-600-900 Constant Voltage DC Arc Welder for Automatic Welding ☐ 200 to 600 amp. Electric Drives ☐ 200 to 600 amp. Gas Drives ☐ 250 amp. Gas Drive ☐ 180-500 amp. Transformers.

Name _____ Position _____

Firm _____

Address _____



XLO

EX-CELL-O for PRECISION

STYLE 1212-A. For identical or different operations at each end. When loading time of parts approximates the time of machining, a double-end machine practically doubles production capacity.

You buy Profit Insurance

when you replace obsolete equipment with these MODERN COST-SAVING MACHINES

STYLE 2112-A. Single-end model for workpieces in the small and medium-size range. Flexible hydraulic controls give easy adjustment of multiple operations.

STYLE 112-C. Large and sturdy with long stroke. Accommodates medium and heavy work, gives maximum precision production, minimum operating cost.

STYLE 17. Massive construction. Maintains the highest precision standards on a profitable production basis. Economical in operation, can be set up for variety of jobs.

With this versatile equipment, you can precision bore, turn, face, counterbore, chamfer, and groove.

These machines are standard, yet they'll handle a large variety of precision operations. Ex-Cell-O also has the standard items of tooling to make this possible at minimum cost.

These fast, sturdy, flexible Ex-Cell-O machines are *profit insurance*. For years to come they will keep on turning out *precision work at maximum production speeds.*

EX-CELL-O

Precision

BORING MACHINES

Get all the facts about them from your local Ex-Cell-O representative, or write for a Precision Boring Catalog.

EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING SPINDLES
CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS
AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

14-3

This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 136 No. 10 March 7, 1955

√ NEWS √ PRODUCTION-ENGINEERING √ MARKETS

Metalworking Outlook 53

The Editor's Views 57

Guaranteed Annual Wage 59
What it means to management, labor and the public

Trucks Get Tubeless Tires 64
An airtight rim helps to eliminate tubes, flaps

Commerce Department Backs Associations 65
Secretary Weeks praises trade association and industry participation in Industry Advisory Committee meetings

Windows of Washington 66

Management at Work 69
Reliance Electric's Chuck Sutherland: "Design by task force pays off"

Steelmaking in Europe 70
At record levels. No order slack. Great Britain leads

Suggestion on Suggestion Systems 71
More metalworking companies are learning how to use them

Mirrors of Motordom 73

The Business Trend 77

Men of Industry 81

Metalworking in the West 101
Growth has doubled in ten years

Opportunity for Aluminum Impact Extrusions 102
The technique made history with tooth paste tubes. It's now used to tackle jobs like large gas cylinders

Salt Quench Aids Dimension Control 104
Martempering punches and dies at lower temperature than the MS point minimizes heat treat distortion

Tips on Titanium Cutting 106
Research turned up practical recommendations for cutting the metal. Here are proved techniques

Kaiser Steel: A Giant in One Generation 110
Peacetime growth of the West made it really expand

Flexible Tools Aid in Fabrication 129
These plastic tools have an added rubber derivative. Flexibility can be varied to suit application

New Products and Equipment 137

The Market Outlook 157
Metal Prices and Composites begin on Page 158

Nonferrous Metals 160

Behind the Scenes 6
Letters to the Editors 10
Calendar of Meetings 23
Obituaries 84
Helpful Literature 153

Editorial, Business Staffs—16. Advertising Index—186. Editorial Index available semiannually. STEEL is also indexed by Engineering Index Inc., 29 West 39th St., New York 18

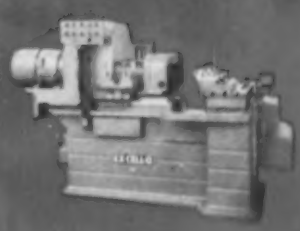
Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, O. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $7.50; two years $13; all other countries, one year $20. Single copies (current issues) 50 cents. Metalworking Yearbook issue $2.00. Acceptance under Sec. 34.64 P. L. & R. authorized. Copyright 1955 by Penton Publishing Co.

XLO

PRECISION BORING MACHINES

High production, cost-saving machines for fast, accurate boring, turning, facing, chamfering and grooving.

Standard Precision Boring Machines



Cam-type Precision Boring Machines

Way-type Precision Boring Machines

Vertical Precision Boring Machines

EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN

for light grinding and polishing

GRIND-O-FLEX

FLEXIBLE GRINDING WHEEL

This fast-cutting grinding wheel removes burrs, flash, tool marks from contoured parts without digging into the metal. Consists of hundreds of "leaves" of aluminum-oxide cloth sealed to a core. Attaches to your present power tools or any rotating spindle. No special equipment to buy. Wide range of grits. Safe and easy to use. Mount several wheels side by side for any required width. There's nothing like it.

For finishing complex contours

SAND-O-FLEX

BRUSH-BACKED ABRASIVE WHEELS

Use Sand-O-Flex for lighter and more intricate contour work on metals, plastics, wood, rubber, etc. Cannot gouge, "flat" or mar surfaces. Attaches to motor shaft or power tools. Available in four sizes from portable to heavy-duty production line models. Refill abrasive cartridges range from coarse to very fine for all types of finishing and polishing. Write for catalog and prices.

MERIT PRODUCTS, INC.

4023 IRVING PLACE, CULVER CITY, CALIF.

behind the scenes

Guilty, Or Not Guilty?

A weasel is a small slender-bodied carnivorous mammal allied to the minks and polecats, and the name is sometimes applied to a person who tries to wriggle out of an awkward situation after abandoning ethics. This Shrdlu business, now, was set up by the publishers of STEEL in an attempt to reach our readers informally; it is believed that the neighborly approach and friendly comment about activities behind the scenes might strengthen the cordial relations existing between STEEL and its readers. However, addressing an unseen audience suggests shouting up an elevator shaft: It's something like talking to yourself. Advertisers and editors are not above resorting to tricks to check readership. Sometimes they will print things upside down, or spell words in a manner that would startle Webster, or make contradictory statements—all harmless, of course, but calculated to stir readers to reveal themselves.

How about the slips and errors that crop up on this page so frequently? Ah, that weasel we mentioned a moment ago might try to wriggle out of his bloomers (an unconscious pun, we assure you) by claiming they were deliberate, but that wouldn't be ethical. Worse than that, it wouldn't be true. The infliction of sloppy and poorly edited prose on intelligent readers is something up with which no astute publisher is going to put, so it may be that poor ol' Shrdlu is being readied to walk the plank.

Proofreader Gets The Point

Speaking of careful editing, Editor Irwin Such installed a special proofreader in the editorial rooms a short time ago. Heinz von Koschembahr, who is as cozy with appositional, parenthetical or independent phrases as Liberace is with his keyboard, needed no urging to attack typographical deviation wherever it raised its inky head. He swarms over page proofs like a man possessed, and questions everything that he has reason to believe is at variance with the written rules that govern grammar, punctuation, spelling and the proper use of words. Editors now think twice before they abandon their manuscripts to the typesetters, because if the type follows copy, and Heinz trips them up, they get that foolish feeling. (This is the only editorial page that escapes Copy Editor Harry Chandler and Proofreader von Koschembahr. While this lack of competent supervision insures our informality, it also helps explain our slipshod copy.) Anyway, coming back to Heinz: Last week, after examining a corrected proof, he shouted, "Ha! A mistake! Here is *a wrong font period!*"

Boy Farmers Impress Editor

Since the middle of February Associate Editor Tom Hruby has been brooding over the decision that made him follow journalism instead of farming. It all began when he attended a Future Farmers of America Foundation luncheon and meeting. Industry has a big stake in the FFA; American Steel & Wire, Republic Steel, Lincoln Electric and many other important business organizations sponsor these groups of high school farmers. "You ought to hear these kids stand up and talk," said Hruby. "Real neat and sharp, and right on the ball. They make reports, like first they sold papers and got a couple of cows, and now they got a herd, and a new car, and money in the bank! I figured I missed the boat by not getting in the farming business young—and I still thing so, until I remember that they all get up around 4:30 A.M."

Will Tenpins Be Tinpins?

Associate Editor Van Caldwell sat in at a gathering of the Grand Rapids Branch of the American Electroplating Society two weeks ago. The occasion was a dinner and an educational meeting, and Van read a paper on metallurgical progress. "Here we were," said Van, "discussing titanium, aluminum, stainless steels and other metals in a town where wood was king. What do you suppose will happen to Grand Rapids furniture? Judging by the enthusiasm of those Grand Rapids electroplaters, pretty soon we'll all be using chromeplated dining room suites and steel clad davenports."

Shrdlu

(Metalworking Outlook—Page 53)

Sciaky patented Three-Phase Welder at Colorcraft, Indianapolis, Indiana.

PRODUCTION COSTS CUT 50%

with One Sciaky Patented Three-Phase Welder

One small, standard Sciaky Three-Phase welder and *one* worker, not skilled, now join more aluminum pitchers and handles for Colorcraft than three workers previously did with screws. Cost per unit is cut in half. Production is increased from 140 to 160 units per hour. Rejects have virtually been eliminated and welds are neater in appearance than screws.

A Sciaky balanced load Three-Phase welder with 85% power factor (compared to 30% for conventional single phase) and a 50% reduction in power demand, is far less expensive to operate than unbalanced load welders. Installation cost is estimated at half that of single phase.

Write today for "Resistance Welding at Work," Vol. 4—No. 3, detailing Colorcraft's story. It's dramatic proof of Sciaky's basic thinking—welders designed for *more useful work* at *lowest operating cost* with *maximum reliability*.

FACTS ABOUT SCIAKY'S PATENTED THREE-PHASE

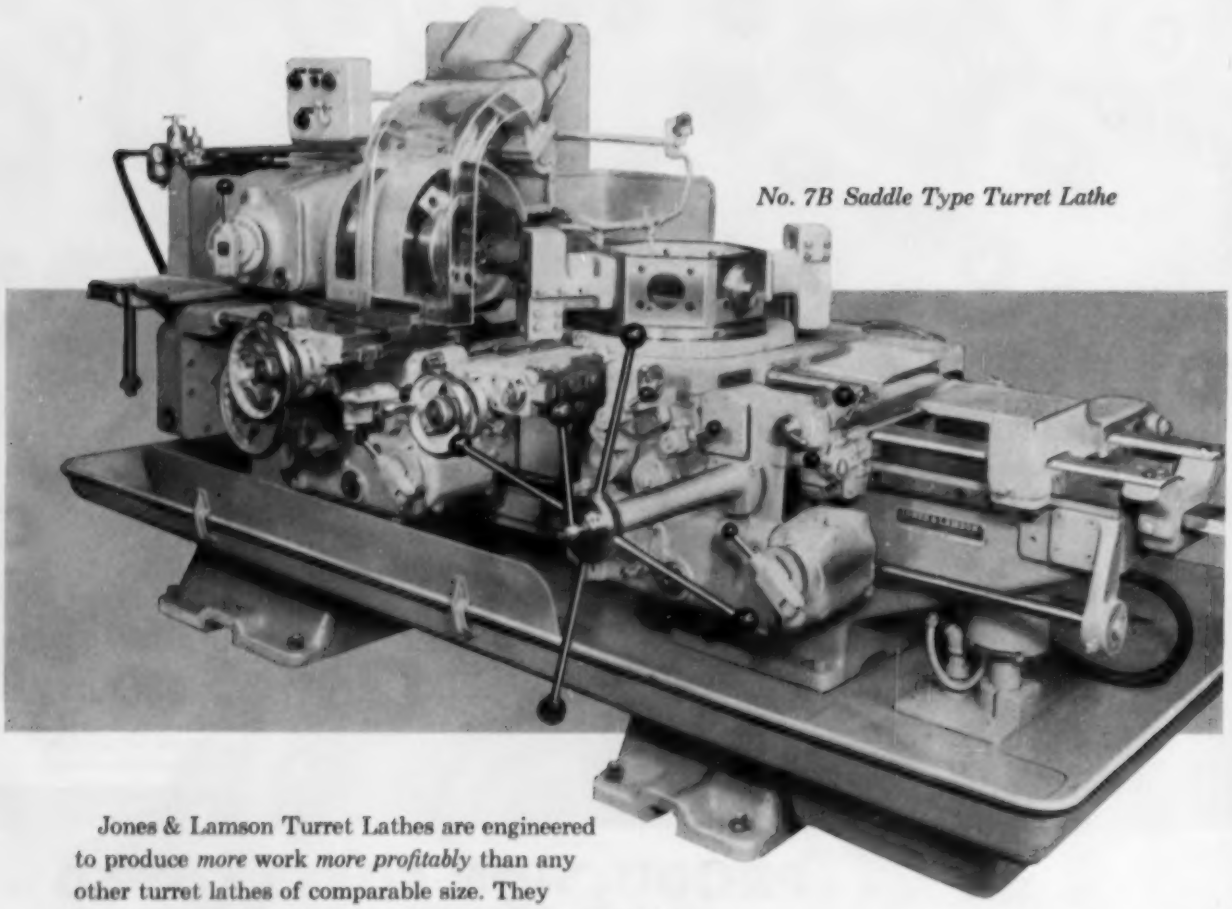
	SINGLE-PHASE	SCIAKY THREE-PHASE	SAVINGS
TRANSFORMER RATING	250 KVA	100 KVA	150 KVA
WELDING KVA DEMAND	650 KVA	325 KVA	325 KVA
LINE AMPS PER CONDUCTOR 440 V.	1,476 A.	430 A.	1,046 A.
POWER FACTOR	30%	85%	Greatly Improved
INSTALLATION COST—EST.	$10,500	$5,250	$5,250

Largest Manufacturers of Electric Resistance Welding Machines in the World

SCIAKY®

Sciaky Bros., Inc., 4909 West 67th Street, Chicago 38, Illinois

Engineered for Precision... Powered for Production...



No. 7B Saddle Type Turret Lathe

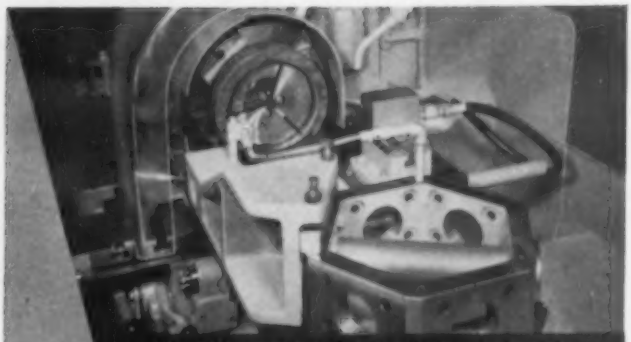
Jones & Lamson Turret Lathes are engineered to produce *more* work *more profitably* than any other turret lathes of comparable size. They have the rugged, rigid construction that makes possible greater accuracy and the use of Hi-Velocity turning; and they incorporate many superior features that assure PRODUCTIVE CAPACITY unmatched in its class. Adequate spindle speeds and horsepower insure the proper use of carbide cutting tools at surface speeds of 650-750 feet per minute.

J&L JONES & LAMSON MACHINE COMPANY

Jones & Lamson offers you a choice of methods for acquiring modern, profit-producing J & L equipment. In addition to outright purchase, J & L makes available several different "Pay-From-Productivity" plans at interest rates of 3¼% and lower (add-on), and a broad variety of lease plans.

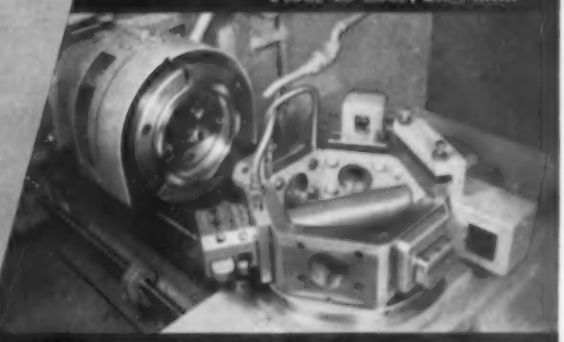
Send today for complete details on J & L's machines, methods and Procurement Plans. Simply fill in the coupon, clip it to your letterhead and mail.

and capable of doing jobs like this...



First Operation: One tool mounted on the Hex Turret turns the O.D. while a tool mounted on the rear of the cross slide faces one end. At the end of the facing cut, the radius on the O.D. is formed.
Floor-to-floor, 1.94 min.

Second Operation: Location is taken from the two previous finished surfaces. Boring and I.D. chamfering are performed by using tools mounted on the Hex Turret while facing and forming of the O.D. are finished by tools mounted on the rear of the cross slide.
Floor-to-floor, 2.57 min.



Third Operation: Special wrap-around jaws mounted on a power operated three-jaw scroll chuck are used for holding the finish turned ring when grooving. The groove is formed by a radius tool held in a bar mounted on the Hex Turret (this applies to internal or external straight or taper races). I.D. is also chamfered in this operation.
Floor-to-floor, 1.67 min.

Machine tools do not pay dividends unless they are cutting metal. Engineering the tooling around the parts to be produced reduces the setup time to a minimum, and in many cases doubles the production per labor hour.

In this case high production methods of tooling for automatic lathes were simplified and applied to three 7B J&L Universal Saddle Type Turret Lathes. Inner and Outer Ball Bearing Races and Roller Bearing Races are produced on the same machines. Setup time from one lot to the next does not exceed fifteen to twenty minutes per machine.

MACHINE TOOL DIVISION

UNIVERSAL TURRET LATHES • FAY AUTOMATIC LATHES • AUTOMATIC DOUBLE-END MILLING & CENTERING MACHINES • AUTOMATIC THREAD & FORM GRINDERS • OPTICAL COMPARATORS AUTOMATIC OPENING THREADING DIES & CHASERS

517 Clinton St., Dept. 710, Springfield, Vt., U.S.A.

Jones & Lamson Machine Company
517 Clinton St., Dept. 710, Springfield, Vt., U.S.A.

Please send me the J & L Machine Tool Replacement Information Kit.

Name _____

Title _____

GERMANIUM RECTIFIERS PERFORM WITH TOP EFFICIENCY

Udylite Tests Reveal Amazing Current Conversion Efficiency

This air cooled germanium cell with a rectifying surface the size of a dime will handle a 250 ampere load in a three phase circuit continuously and three years of tests show no detectable power losses. Including heat-radiating fins, it takes up just 8 cubic inches of space and weighs only 12 ounces.

Udylite in cooperation with the General Electric Company, now proudly introduces its new group of germanium rectifiers. Years of research and testing have proven that no other metal known offers the high efficiency of germanium as a rectifier material.

In operations calling for medium to high voltages, such as barrel plating, anodizing or chrome plating the efficiency of germanium soon pays the cost since the efficiency of a 3-phase germanium cell is *98* to *99 percent.*

Even at high loading germanium has less than one-volt drop in the forward direction. As for reverse current, germanium is again particularly good, having a reverse-to-forward resistance ratio of 400,000 to 1. Furthermore, Udylite germanium rectifiers require little maintenance and can be located in areas of minimum ventilation.

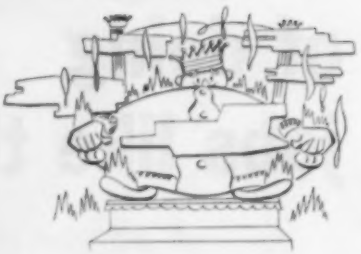
For further information regarding germanium rectifiers—prices, deliveries and specifications—consult your Udylite representative or write today direct to:

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

WORLD'S LARGEST PLATING SUPPLIER

LETTERS
TO THE EDITORS

Where Heat Is King



Please send us two copies each of parts I and II of the article, "Where Heat Is King" (Jan. 31, p. 86; Feb. 7, p. 146), by Alan Levy, supervisor, material & process section, Marquardt Aircraft Co., Van Nuys, Calif. These articles are exceptionally outstanding.

M. B. Lieberman
Security Alloys Co, Inc.
Chicago

Please send a copy of the article. . .

Leon Eriv
metallurgist
American Can Co.
Newark, N. J.

We would like to have several reprints of both sections. . .

Joseph J. Phillips
development and technical services
Haynes Stellite Co.
Kokomo, Ind.

. . . we are interested in receiving about 20 copies of these articles.

J. W. Douglass
sales promotion department
McKay Co.
Pittsburgh

Please send us ten reprints of the article. . .

John C. Hawes
sales department
Damascus Tube Co.
Greenville, Pa.

• *Sent.—ED.*

Seeking More Control

In your article, "Coming: More Office Automation" (Jan. 24, p. 37), you mention the Comptrollership Foundation. I am interested in getting more information concerning that foundation.

S. J. Hartmann
American Can Co.
Pacific Division
San Francisco

• *Write to Paul Haase, secretary, Controllers' Institute of America, New York.—ED.*

Crow About Your Products

I would like two copies of your article, "Product Communication Paves the Way for Greater Sales," (Feb. 14, p. 73), No. 1 in STEEL's 1955 Program for Management. (The nation's product

(Please turn to page 12)

A completely new and different

PAYLOADER®

TRACTOR SHOVEL

NEW MODEL HA

BUCKET CAPACITY
18 cu. ft.
PAYLOAD
14 cu. ft.
Struck-Load

NEW standards of safety, capacity and low maintenance

The greatest advance in tractor-shovel design in years — with more features — more digging power — more capacity — more performance than you ever thought possible in a tractor-shovel of this size.

The famous HA "PAYLOADER" has led the industry for over 15 years — this NEW 1955 Model HA is even more sensational. It has twice the digging power, lifting capacity and carrying capacity — has 16⅔% more bucket capacity — 18% more dumping height — and will increase output from 50 to 100%.

Before you buy any tractor-shovel, see this new Model HA — ask your dealer for a demonstration — find out what it can do to reduce *your* bulk material handling costs.

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. • LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

Outstanding features:

Powerful "break-out" digging action Upward rotation of the bucket combines with forward motion of machine in a powerful slicing action that gets full loads quickly, even from lumpy, sticky or heavy materials.

Bucket tip-back of 40 degrees when only 6 inches off the ground carries heaped loads *low* and *close* for maximum stability, balance and safety.

New standards of safety Boom arms and parts are mounted *low* and carry loads *low* and are always clear of the operator. Operator visibility is good at all times.

Advance-design hydraulic system includes: sealed, pressurized hydraulic tank — no breathing of dirt and grit into hydraulic fluid; hydraulic accumulator prevents pressure shocks — gives easier, safer control.

Torque-converter drive and full-reversing transmission with two speed ranges insures fast moves in either direction — easier operation and control — more production.

Improved steering. Ball-bearing screw-and-nut type steering with tapered roller bearing bell crank and oversize ball joints — easy-acting, readily-adjusted, low in maintenance.

GAS OR DIESEL POWER OPTIONAL.

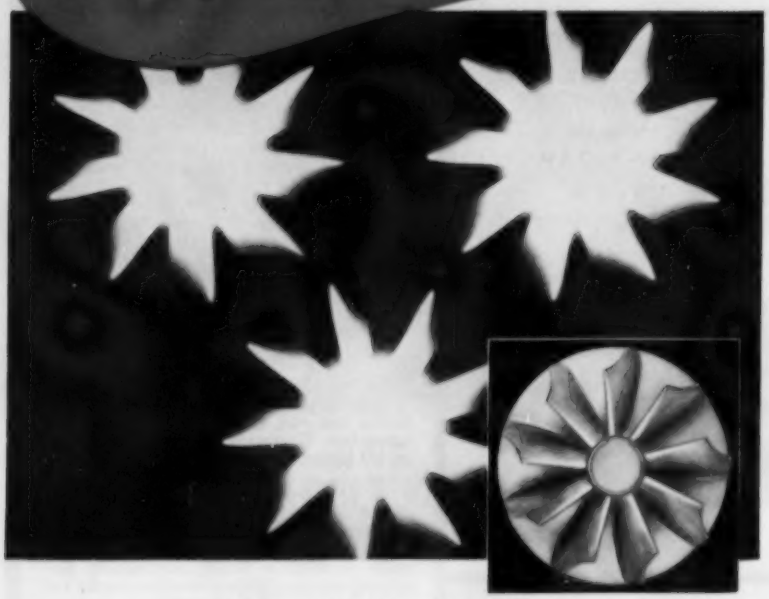
THE FRANK G. HOUGH CO.
176 Sunnyside Ave., Libertyville, Ill.

☐ Send me complete model HA information
☐ Send name of my "PAYLOADER" Distributor

Name .....
Title .....
Company .....
Street or Box No. .....
City ..... State .....

INSIDE STORY

Austenal Quality Control



The same technique used in the investment casting of finely-wrought surgical and dental applicances in non-machinable metals is put to work for modern industry in Austenal's unique Microcast process. Complex precision parts, such as turbine buckets and vanes or the wheels pictured above by X-Ray, are cast directly, eliminating costly machining and holding finishing to a minimum.

From the initial mold to the finished casting, Austenal's skilled technicians check for correctness of detail and dimensional accuracy. Then, the completed part is subjected to Zyglo and X-Ray examination to search out any internal structural flaws and assure that each part released by Austenal will deliver according to the highest performance standards.

Through sound production, skilled engineering and rigid Quality Control, Austenal serves a growing need in American industry and national defense for finer, high-performance precision castings.

See Austenal's original informative 16mm color movie, "A Story of Industrial Progress". Available without charge.

austenal

LABORATORIES, INC.

microcast division

224 EAST 39th STREET · NEW YORK 16, N. Y.

LETTERS

(Concluded from page 10)

communication budget and the value placed on all passenger cars shipped by the auto industry last year ran neck and neck. Both figures bulked well over the $8-billion mark. . .)

B. E. Godard
New Product Engineering Department
Bakelite Co.
New York

. . . I enjoyed reading it, and think that you did a splendid job.

R. W. Boggs
Union Carbide & Carbon Corp.
New York

. . . frankly, this is one of the soundest approaches to a discussion of advertising and sales promotion we've seen in a long time.

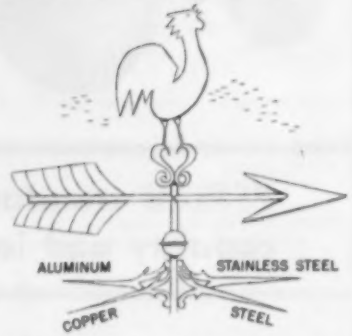
John Lange
R. H. Young & Associates
West Hartford, Conn.

. . . please send one copy.

John A. Connell
chief, Federal Cataloging Branch
Cataloging Office
Transportation Materiel Command
Marietta, Pa.

• *Sent.—ED.*

Metal Consumers Located



I am interested in obtaining reprints of your articles on the geographic distribution of metals (Jan. 17, Jan. 25, Jan. 31, and Feb. 7).

Agnes Cunningham
Kaiser Aluminum & Chemical Corp.
Central Analysis & Planning Dept.
Oakland, Calif.

Please send us reprints of each article. . .

W. T. Miller
Bohn Aluminum & Brass Corp.
Chicago

We'd be interested in a reprint of each. . .

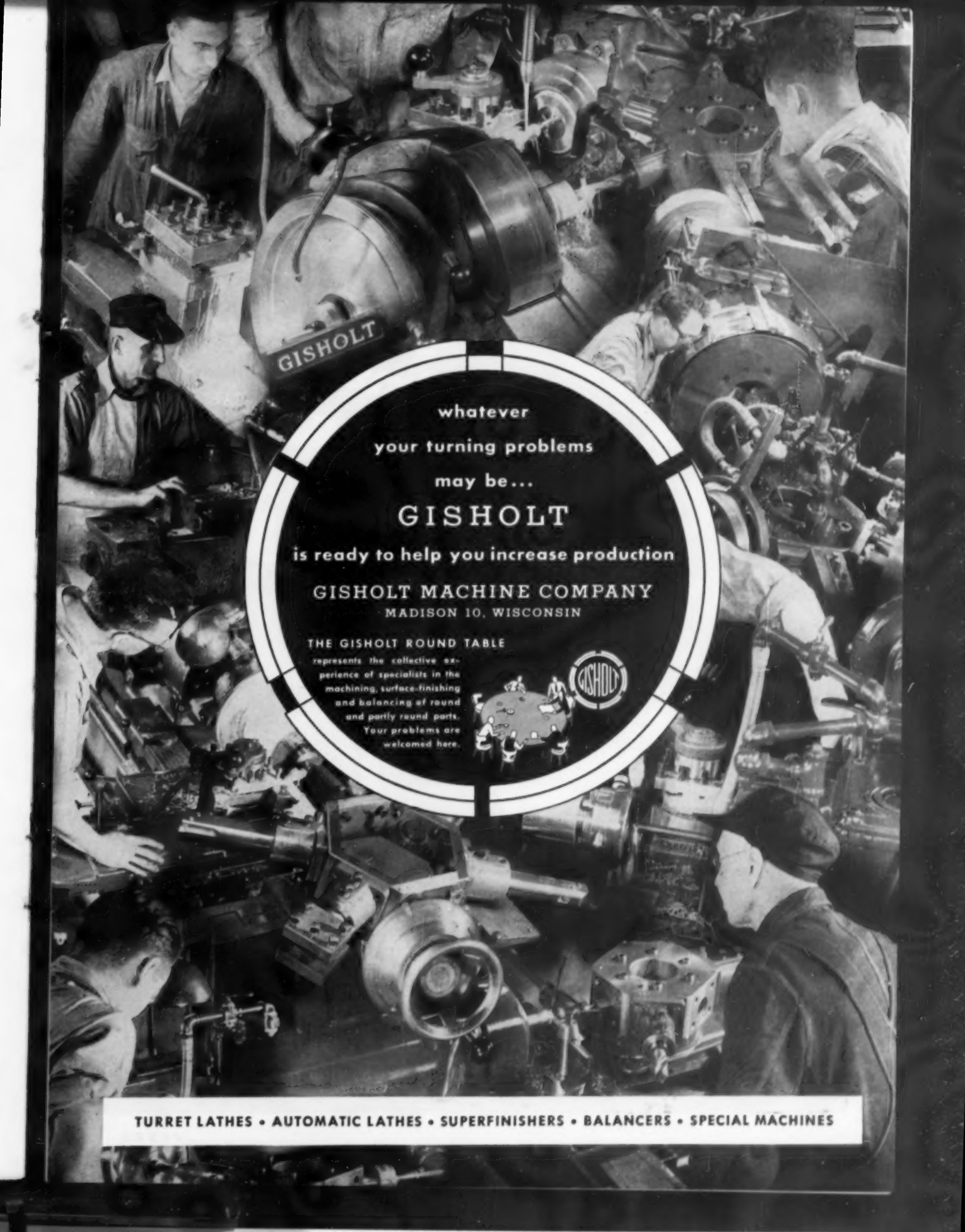
Frank A. Norton
manager, commercial research
Bethlehem Pacific Coast Steel Corp.
San Francisco, Calif.

• *Sent.—ED.*

Unearned Raise

I would like to point out an error in the article, "Firms Bid High for Graduates" (Feb. 28, p. 60). Postgraduate students are only being offered about $400 a month. Your article incorrectly states that the average is about $440.

William A. Lloyd
director of public relations
Associated Industries of Cleveland
Cleveland


GISHOLT
whatever
your turning problems
may be...
GISHOLT
is ready to help you increase production
GISHOLT MACHINE COMPANY
MADISON 10, WISCONSIN
THE GISHOLT ROUND TABLE
represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.
GISHOLT
TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

His
"6th Sense"
is mostly
good
business sense
MORSE
Franchised
Distributor

. . . another good reason why it pays to depend on your

MORSE - FRANCHISED DISTRIBUTOR

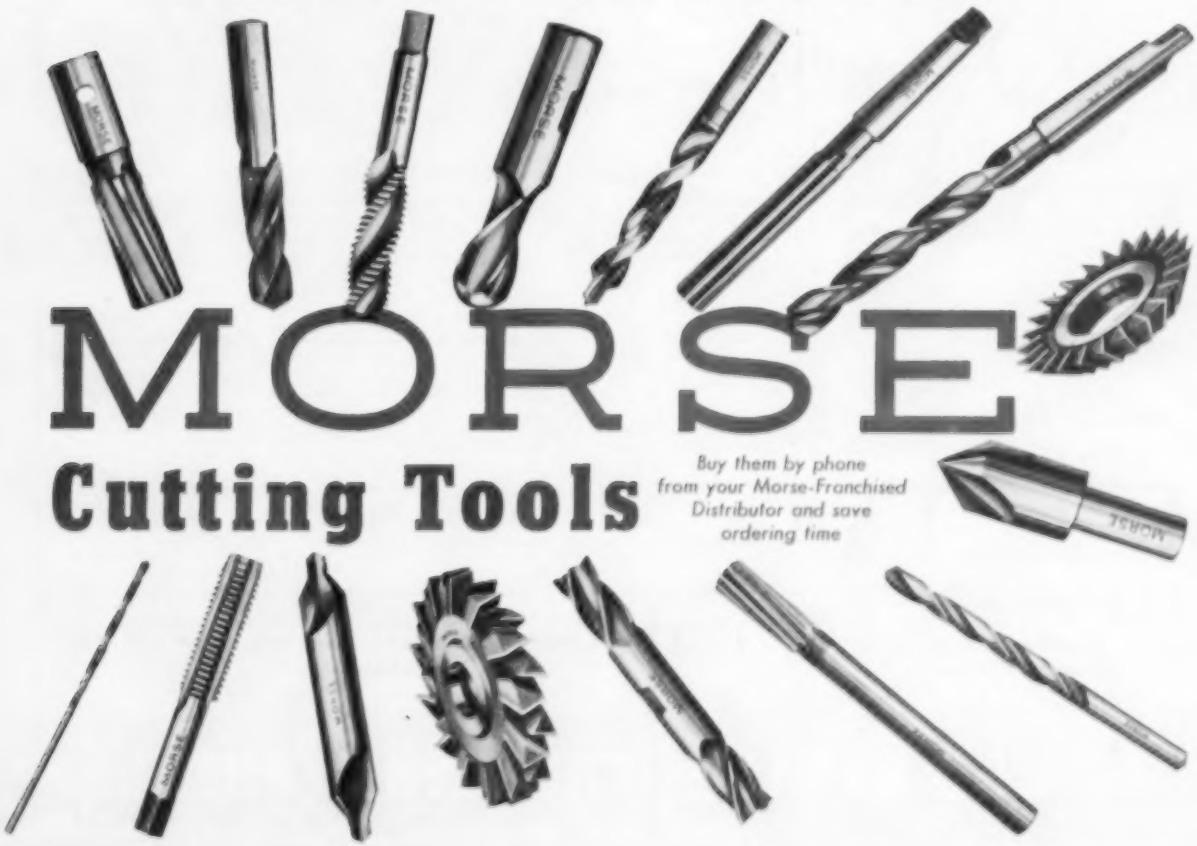
It's his good business sense that helps your Morse-Franchised Distributor to anticipate your wants — and keeps him constantly on the alert for those products you might need.

This foresightedness is an invaluable protection for you in your supply problems . . . just as the Morse Line is top protection for your cutting-tool dollar. On any job, Morse can give you the most for your money . . . and your Morse-Franchised Distributor is always right on deck to see that you get it. So for drills, taps, dies, reamers, end mills and cutters . . . plain or Electrolized . . . *depend* on your Morse-Franchised Distributor.

MORSE TWIST DRILL & MACHINE COMPANY

(Division of VAN NORMAN COMPANY)

NEW BEDFORD, MASS. · *Warehouses in* New York, Detroit, Chicago, Dallas, San Francisco



MORSE

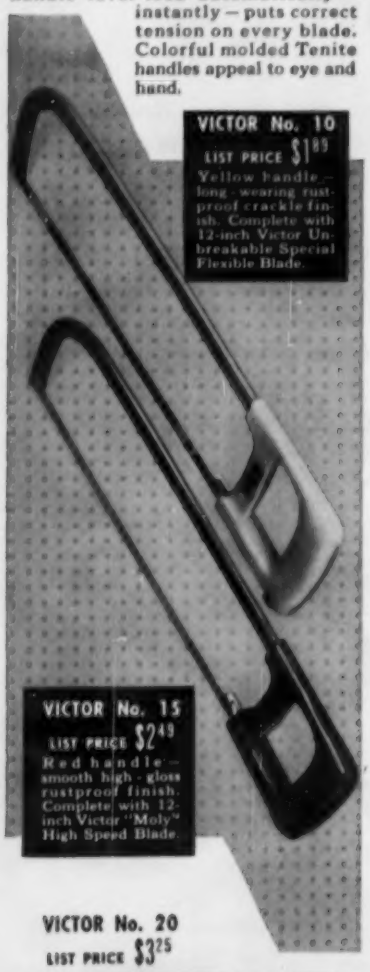
Cutting Tools

Buy them by phone from your Morse-Franchised Distributor and save ordering time

2 new frames

COLORFUL FUNCTIONAL DESIGN

The new Victor No. 10 and No. 15 frames fit either 10-inch or 12-inch blades, yet are built around a solid, one-piece steel backbone, the most rigid construction ever devised. New under-the-handle lever-lock automatically — instantly — puts correct tension on every blade. Colorful molded Tenite handles appeal to eye and hand.



VICTOR No. 10
LIST PRICE $1.85
Yellow handle — long-wearing rust-proof crackle finish. Complete with 12-inch Victor Unbreakable Special Flexible Blade.

VICTOR No. 15
LIST PRICE $2.49
Red handle — smooth high-gloss rustproof finish. Complete with 12-inch Victor "Moly" High Speed Blade.

VICTOR No. 20
LIST PRICE $3.25

Long-time mechanics' favorite. Adjustable for 10-inch or 12-inch blades. Extra-leverage tension lock.

Sold Only Through Recognized Distributors

VICTOR

SAW WORKS, INC. • MIDDLETOWN, N. Y., U.S.A.
Makers of Hand and Power Hack Saw Blades; Frames; Metal & Wood Cutting Band Saw Blades.

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Editor, IRWIN H. SUCH
Managing Editor, WALTER J. CAMPBELL
Assistant Managing Editors, VANCE BELL, JOHN S. MORGAN

WILLIAM M. ROONEY ..... *Market Editor*
J. D. KNOX ..... *Steel Plant Editor*
HARRY E. CHANDLER JR. ..... *Copy Editor*
ALLEN G. GRAY ..... *Technical Editor*
ROBERT F. HUBER ..... *Machine Tool Editor*

FRANK R. BRIGGS ..... *Associate Editor*
THOMAS F. HRUBY ..... *Associate Editor*
ROBERT O. JAYNES ..... *Associate Editor*
VAN CALDWELL ..... *Associate Editor*

ARTHUR W. ZIMMERMAN ..... *Assistant Editor*
JAMES P. MORRISSEY ..... *Assistant Editor*
AUSTIN E. BRANT ..... *Assistant Editor*
MICHAEL A. L. WEBSTER ..... *Assistant Editor*
STANLEY B. STEWART ..... *Assistant Editor*
HEINE VON KOSCHEMBAHR ..... *Assistant Editor*
MARY T. BORGERHOFF ..... *Assistant Editor*
MARY ALICE LYMAN ..... *Assistant Editor*

BARBARA DAVIS ..... *Editorial Assistant*
MARY ANN STUVE ..... *Editorial Assistant*
JEAN MCNAMES ..... *Editorial Assistant*
EILEEN COSTES ..... *Editorial Assistant*

Resident Editors

New York 17 ..... 60 East 42nd St.
B. K. PRICE, L. E. BROWNE
Murray Hill 2-2561

Chicago 11 ..... 520 North Michigan Ave.
ERLE F. ROSS, WILLIAM E. DEAN
Whitehall 4-1234

Pittsburgh 19 ..... 2837 Koppers Bldg.
ROBERT M. LOVE
Atlantic 1-3211

Detroit 26 ..... 1249 Washington Blvd.
FLOYD G. LAWRENCE
Woodward 3-3488

Washington 4 ..... 1123 National Press Bldg.
E. C. KREUTZBERG
Executive 3-6849

London, 2 Caxton St., Westminster S. W. 1
VINCENT DELPORT
European Editor

Editorial Correspondents

Birmingham ..... R. W. KINCEY
Birmingham 3-1121

Buffalo ..... L. G. FELDMANN
Cleveland 5353

St. Louis ..... MAC L. HUTCHENS
Republic 7752

Youngstown ..... GEORGE R. REISS
Riverside 7-1471

Los Angeles ..... NORMAN LYNN
Webster 5-3040

San Francisco ..... EDWIN HAVERTY
Yukon 6-5151

Seattle ..... R. C. HILL
Melrose 1895

Cincinnati ..... JACK DUDLEY
Beechmont 7598

Toronto ..... F. S. TOBIN
Empire 4-9655

Birmingham, Eng. ..... J. A. HORTON

Paris, France ..... LEON JAUDOIN-PROM

Liege, Belgium ..... M. JACQUES FOULON

Dusseldorf, Germany ..... DR. HERBERT GROSS

BUSINESS STAFF

Business Manager ..... J. W. ZUBER
Promotion Manager ..... S. F. MARINO
Circulation Manager ..... G. R. EBERSOLE
Market Research Mgr. ..... N. R. LADABOUCHE
Statistician ..... G. J. AUNER
Advertising Director ..... H. G. ROWLAND
Advertising Service Mgr. ..... DORIS ROBBINS
Production Manager ..... A. V. ANDERSON
Mail & List Service ..... AMY LOMBARDO
Reprints ..... C. B. NILES

Advertising Representatives

New York 17 ..... 60 East 42nd St.
K. A. ZOLLNER, GUY LABAW
Murray Hill 2-2561

Philadelphia ..... 200 Wynnewood Ave.
Wynnewood, Pa.
WM. J. VERSCHOOR
Midway 2-6512

Farmington, Conn. ..... 12 Farmstead Lane
CALVIN FISHER JR.
Orchard 7-1756

Pittsburgh 19 ..... 2837 Koppers Bldg.
J. C. SULLIVAN
Atlantic 1-3211

Cleveland 13 ..... Penton Building
D. C. KIEFER, E. H. THOMAS
Main 1-8260

Cincinnati 30 ..... 5565 Beechmont Ave.
E. L. FRANKE—Parkway 3040

Detroit 26 ..... 1249 Washington Blvd.
C. A. TALLINGER, JR.—Woodward 3-3488

Chicago 11 ..... 520 North Michigan Ave.
L. C. PELOTT, W. L. POLAND
JOHN W. VAUGHAN
Whitehall 4-1234

Los Angeles 48—6262 Commodore Sloat Dr.
F. J. FULLER—Webster 1-6865

San Francisco 4 ..... 57 Post St.
F. J. FULLER, Robert W. Walker Co.
Butter 1-5568

Griffin, Georgia ..... 331 South 12th St.
FRED J. ALLEN—Griffin 7854

BPA

Published Every Monday by
THE PENTON PUBLISHING CO., Penton Bldg., Cleveland 13, Ohio
MAin 1-8260

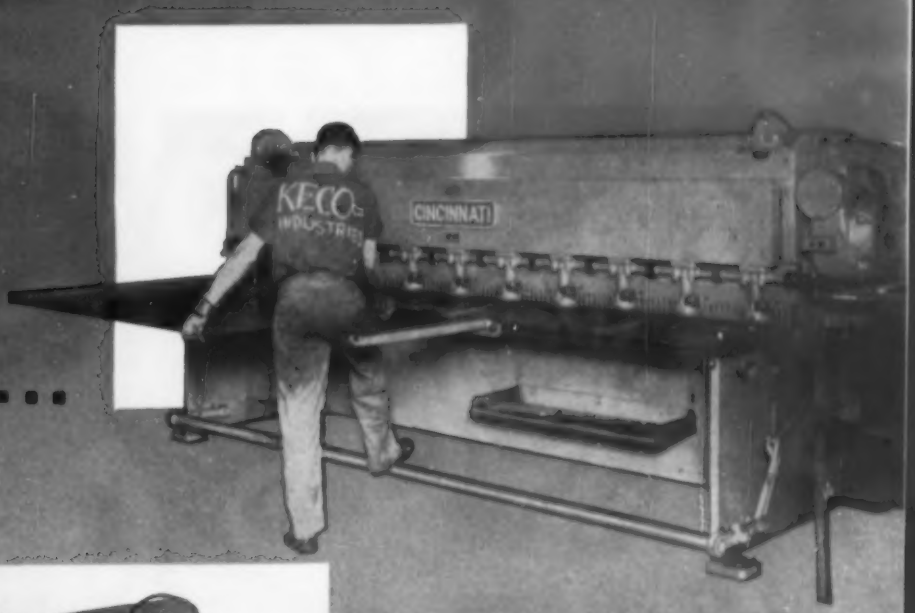
G. O. HAYS ..... *President and Treasurer*
R. C. JAENKE ..... *Executive Vice President*
F. G. STEINEBACH ..... *Vice President and Secretary*
F. O. RICE ..... *Vice President*
J. P. LIPKA ..... *Asst. Secy. and Asst. Treas.*

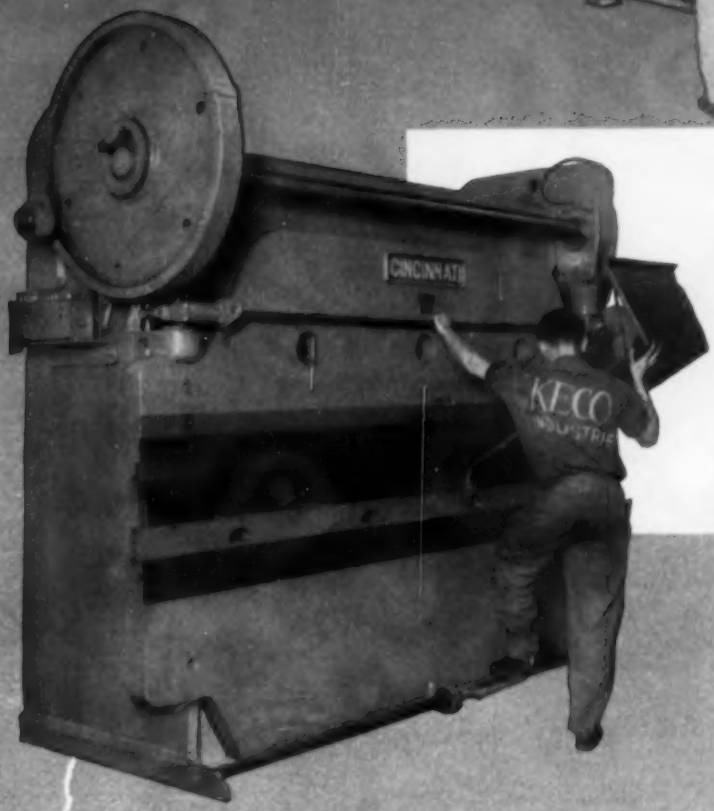
Also Publisher of
FOUNDRY, MACHINE DESIGN, NEW EQUIPMENT DIGEST, AUTOMATION

Member of Business Publications Audit of Circulation Inc., Society of Business Magazine Editors and National Business Publications Inc.

NBP

3 times as fast...





Photographs courtesy of the Keco Industries, Cincinnati 25, Ohio

with this CINCINNATI team

Cooling towers for portable air conditioning units

The floor-to-floor time consumed in shearing and forming panels for air-conditioning units, was cut from 12 minutes to 4 minutes at Keco Industries, using a Cincinnati Brake and a Cincinnati Shear.

Accuracy and rapid handling effected these savings.

In your shop, there may be opportunity for real cost reductions. Investigate Cincinnati Shears and Cincinnati Press Brakes.

Write for Cincinnati Shear Catalog S-6 and Cincinnati Brake Catalog B-4.

CINCINNATI

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

FLEXLOC AT WORK

MORE AND MORE FLEXLOC LOCKNUTS are being used on applications where dependable locking is essential to the operation of the equipment and the safety of the operator. This bundling chain with automatic lock provides positive grip and safe, sure bundle handling.

Two FLEXLOC Self-Locking Nuts hold this assembly together. Once the locking threads are fully engaged, the nuts won't work loose, regardless of the conditions under which they are used.

FLEXLOC one-piece, all-metal nuts are available in a full range of sizes in any quantity. Standard FLEXLOCS are stocked by leading industrial distributors everywhere. Write for Bulletin 866 and samples. STANDARD PRESSED STEEL CO., Jenkintown 33, Pa.

DO YOU KNOW? Standard FLEXLOCS smooth off rough bolt threads. The locking threads on all-metal FLEXLOCS are not chewed up when used on rough bolts.

Standard FLEXLOCS lock securely on bolts varying in diameter tolerances. The all-metal, resilient locking sections of the nut accommodate themselves to the diameter tolerances.

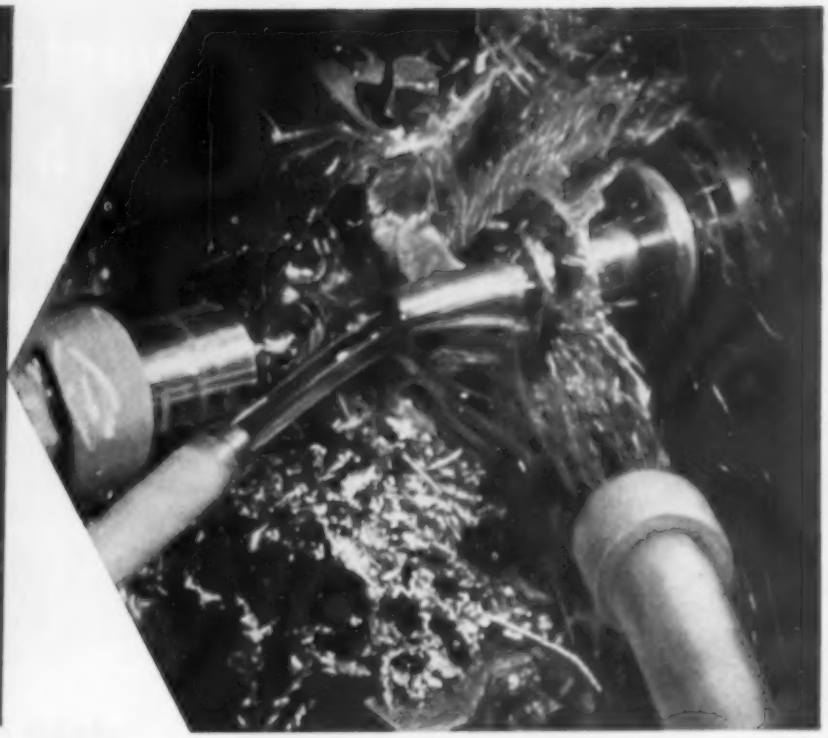
Standard FLEXLOCS are one piece, all metal. They are not affected by temperatures to 550°F. Nuts lacking these features have a more restricted temperature range.

Standard FLEXLOCS lock securely—stopped or seated—when 1½ threads of a standard bolt are past the top of the nut.

Standard FLEXLOCS are not affected by moisture, oil, dirt or grit. They lock efficiently under all conditions, regardless of the vibration encountered.

FLEXLOC®
LOCKNUT DIVISION
SPS
JENKINTOWN PENNSYLVANIA

NEW
ATLANTIC
Cutting
Oils



Cut the Tough Jobs Down to Size

No need to pamper these Atlantic Cutting Oils. Put them to work on the toughest cutting job in the shop. Then see the difference they can make . . . in long tool life, top production, even in shop morale.

Notice how Atlantic non-soluble cutting oils give you high production on hot, tough jobs — and without foul odors. Note, too, that the work is visible right through the oil. All these oils are compatible when blended.

Operators like Atlantic Cutting Oils because they do not indelibly stain hands and clothing . . . they make a cleaner shop possible.

You can get full information on these oils and a copy of the valuable new Cutting Oil Selector Chart, which shows how to select the right Atlantic Cutting Oil for the job. Just write for your copy to a nearby Atlantic office, listed here, or to The Atlantic Refining Company, 260 South Broad Street, Philadelphia 1, Pa.

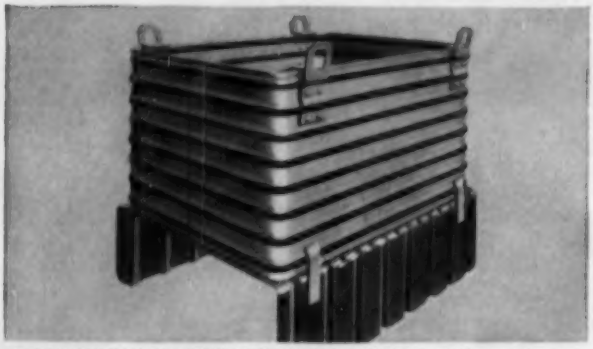
PROVIDENCE, R. I., 430 Hospital Trust Bldg.
READING, PA., First and Penn Avenues
SYRACUSE, N. Y., Salina and Genesee Streets
PITTSBURGH, PA., Chamber of Commerce Bldg.

ATLANTIC

LUBRICANTS · WAXES
PROCESS PRODUCTS

Put this usually wasted space to work with

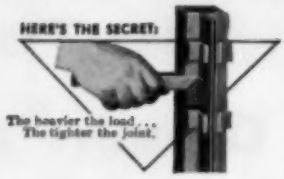
Republic Wedge-Lock long parts storage units



REPUBLIC MATERIALS HANDLING EQUIPMENT is built to meet the requirements of each individual job. Steel boxes, skids and pallets speed production, save floor space, require minimum maintenance, help produce savings. Pictured is the PB-120-CT Box and Skid Unit for use with lift truck. Also fitted with combination tiering and lifting lugs for easy crane handling. Contact your local Republic materials-handling dealer or send coupon for more information.

YOU GET BOTH BEAUTY AND EFFICIENCY when you outfit your office with handsome equipment made by Republic's Berger Division. Smartly styled steel desks feature new eye-comfort tops to reduce eye fatigue. Rigid construction and nylon glides assure smooth non-sticking operation of drawers. Berger's modern Steel Vertical Files, built for a lifetime of service, are striking companion pieces. Send coupon for complete information on the big Berger line.

Exclusive construction permits high stacking of tremendous loads

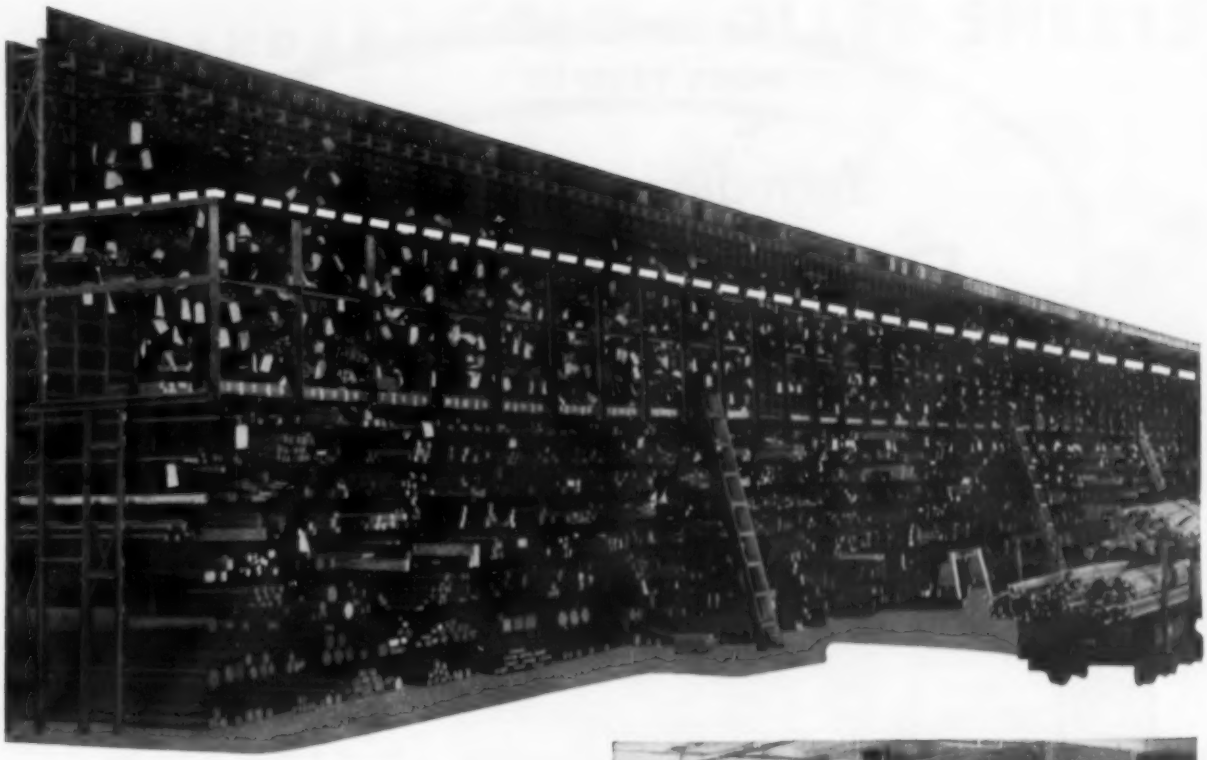


Overhead storage space may be going to waste in your present system. Particularly, where heavy or bulky items are stored.

Wedge-Lock Long Parts Storage Units are specifically designed for high stacking of enormous weights—with no sagging, swaying, or buckling. The reason is the exclusive joint design developed by Republic's Berger Division. As weight increases, joints actually get tighter, increasing the stability and rigidity of the entire assembly. Result: you get maximum loading in a minimum of floor area

REPUBLIC

World's Widest Range of Standard



—plus a more efficient use of overhead space.

Amazing Wedge-Lock increases the efficiency of your entire handling system by providing wide unobstructed aisles, easy access. It is completely flexible, can be assembled quickly and easily to accommodate your own specific storage requirements.

Specify Wedge-Lock for a smooth, fast flow of materials from receiving to shipping. A storage-engineering expert in your nearby Berger Division sales office is always available to help you determine your needs and plan an efficient installation. Call him soon or send coupon for literature and full information on the Wedge-Lock principle.

STEEL

Steels and Steel Products

THE WORLD'S LEADER IN LOCKERS, Republic's Berger Division offers a wide selection of standard steel lockers for every industrial use. Modern design assures full-time protection for personal property. Handles are tamper-proof, cannot be removed. Continuous door strikes along sides prevent insertion of tools for prying. Berger offers a complete locker planning, engineering and installation service. Send coupon for more details.

REPUBLIC STEEL CORPORATION
3120 East 45th Street,
Cleveland 27, Ohio

REPUBLIC STEEL

Please send me complete literature on:

- ☐ Long Parts Storage Units
- ☐ Materials Handling Equipment
- ☐ Lockers
- ☐ Office Equipment

Name_____ Title_____

Firm_____

Street_____

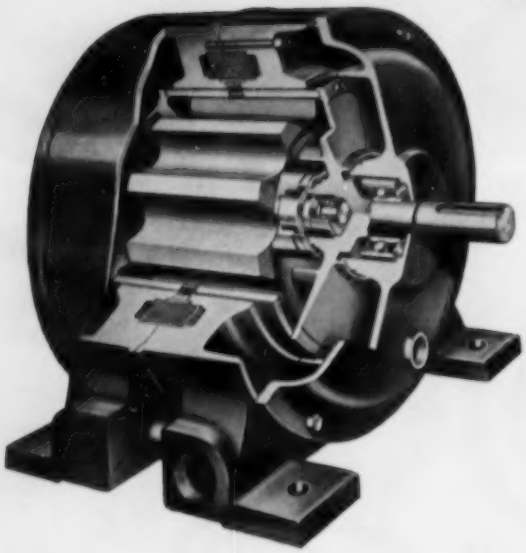
City_____ Zone____ State_____

K-7114

Introducing the New

DYNASPEDE®

Stationary-Field Adjustable Speed Eddy-Current Coupling



★ No brushes, slip rings, or commutator.

★ Completely enclosed; adaptable for operation under hazardous conditions.

★ Wide-range stepless speed control.

★ Reduced maintenance.

Augmenting the well recognized and widely used Dynamatic line of eddy-current couplings, brakes, and drives, the new DYNASPEDE Liquid Cooled Stationary-Field Coupling offers a number of outstanding design and operational advantages.

Principal design features include the mounting of the field section integral with the coupling frame, with the drum-ring rotating concentrically with the field. A toothed rotor (the output member) is mounted concentrically with the drum.

The absence of slip rings and brushes eliminates the possibility of arcing, and adapts DYNASPEDE to hazardous applications in explosive or corrosive atmospheres. Maintenance is materially reduced.

The torque characteristics of the DYNASPEDE coupling are such that with uniform excitation, the torque curve continues to rise with increased slip.

As is the case with all Dynamatic eddy-current couplings, DYNASPEDE provides a very wide range of stepless speed control.

Send for Illustrated Descriptive Literature

EATON

DYNAMATIC®

DIVISION EATON MANUFACTURING COMPANY

KENOSHA, WISCONSIN • General Offices: Cleveland, Ohio

CALENDAR
OF MEETINGS

March 7-11, National Association of Corrosion Engineers: Annual meeting and exhibit, Palmer House, Chicago. Association address: 1061 M & M Bldg., Houston 2. Secretary: A. B. Campbell.

March 8-10, Instrument Society of America, Pittsburgh Section: Instrumentation in the iron and steel industry, Hotel William Penn, Pittsburgh. Information: A. F. Robbins, combustion engineer, Crucible Steel Co., Midland, Pa.

March 10-11, Porcelain Enamel Institute: Pacific coast conference, Biltmore hotel, Los Angeles. Institute address: 1346 Connecticut Ave., N.W., Washington. Secretary: John C. Oliver.

March 13-18, National Electrical Manufacturers Association: Winter meeting, Edgewater Beach hotel, Chicago. Association address: 155 E. 44th St., New York 17. Managing director: W. J. Donald.

March 14-16, Society of Automotive Engineers Inc.: Production meeting and forum, Netherland Plaza hotel, Cincinnati. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

March 14-18, American Society of Tool Engineers: Western industrial exposition, Ambassador hotel and Shrine Auditorium, Los Angeles. Society address: 10700 Puritan Ave., Detroit 21. Executive secretary: Harry E. Conrad.

March 15-16, Steel Founders' Society of America: Annual meeting, Drake hotel, Chicago. Society address: 920 Midland Bldg., Cleveland 15. Secretary: George K. Dreher.

March 15-17, American Institute of Electrical Engineers: National conference on electrical utilization of aluminum, William Penn hotel, Pittsburgh. Institute address: 33 W. 39th St., New York 18. Secretary: N. S. Hibshman.

March 16-18, Pressed Metal Institute: Annual meeting and exhibit, Carter hotel, Cleveland. Institute address: 2860 E. 130th St., Cleveland. Managing director: Orrin B. Werntz.

March 16-19, Industrial Diamond Association of America: Annual meeting, Hollywood Beach hotel, Hollywood Beach, Fla. Association address: 124 E. 40th St., New York. Secretary: Athos D. Leveridge.

March 20-23, National Association of Waste Material Dealers Inc.: Annual meeting, Conrad Hilton hotel, Chicago. Association address: 271 Madison Ave., New York. Secretary: Clinton M. White.

March 21-23, Association of Iron & Steel Engineers: Western meeting, St. Francis hotel, San Francisco. Association address: 1010 Empire Bldg., Pittsburgh 22. Managing director: T. J. Ess.

March 22-24, International Acetylene Association: Annual meeting, Shamrock hotel, Houston. Association address: 30 E. 42nd St., New York 17. Secretary: H. F. Reinhard.

March 23-24, American Society of Mechanical Engineers: Annual engineering management conference, Statler hotel, Cleveland. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

March 24-25, American Hot Dip Galvanizers Association Inc.: Annual meeting, Brown hotel, Louisville. Association address: 1506 First National Bank Bldg., Pittsburgh 22. Secretary: Stuart J. Swensson.

March 24-25, American Machine Tool Distributors Association: Spring meeting, The Greenbrier, White Sulphur Springs, W. Va. Association address: 1900 Arch St., Philadelphia 3. Secretary: Thomas A. Ferniey Jr.

March 28-29, American Institute of Electric Engineers: Materials handling conference, Hotel Cleveland, Cleveland. Institute address: 33 W. 39th St., New York 18. Secretary: N. S. Hibshman.

March 28-30, American Management Association: Manufacturing conference, Palmer House, Chicago. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

COLD-ROLLED SHEETS
NEWEST PRODUCT OF
Newport Steel

Newport Steel completed another phase in its continuing program of expansion when early in 1955 cold-rolled sheets began to flow from a modern and entirely new cold-reduction mill. Customers of this 70-year-old company have waited long for these cold-rolled sheets—now offered for reasonably prompt delivery. With dependability of service and quality of product Newport Steel can serve you on the items listed on the left.

PRODUCTS OF NEWPORT STEEL

Cold-Rolled Sheets
Hot-Rolled Steel in Coil
Hot-Rolled Pickled Steel in Coil
Hot-Rolled Sheets
Hot-Rolled Pickled Sheets
Galvanized Sheets
Galvannealed Sheets
Colorbond Sheets
Electrical Sheets
Alloy Sheets and Plates
Electric Weld Line Pipe
Roofing and Siding
Eave Trough and Conductor Pipe
Culverts

ECONOMICAL WATERAIL DELIVERY

Newport Steel is situated on the Mississippi-Ohio River system and the great Cincinnati rail hub. With the advantage of location, new river barge facilities and seven major railroads, Newport gives economical, dependable delivery to the entire area of the Middle West and South.

Newport Steel
CORPORATION
NEWPORT, KENTUCKY

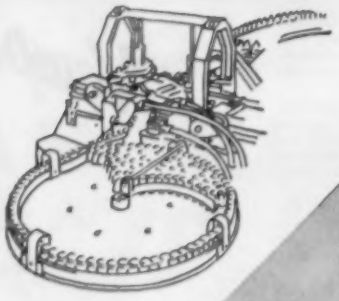
YOUR CONFIDENCE IS JUSTIFIED WHERE THIS FLAG FLIES

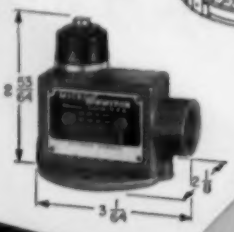
A SUBSIDIARY OF MERRITT-CHAPMAN & SCOTT CORPORATION

MICRO SWITCH Precision Switches
A PRINCIPLE OF GOOD DESIGN

5 Switches bring smooth operation to this automatic bottle labeler

This machine is designed to label bottles at from 90 to 180 per minute. MICRO SWITCH products were selected to prevent jamming or overload. Factors in their selection were precise, dependable operation, long life, quick response to light operating force and sealed plungers to keep out dirt and dust. Perhaps you need a switch to give a new "lift" to your new product. Take the short cut. Ask MICRO SWITCH engineering. There's no obligation.

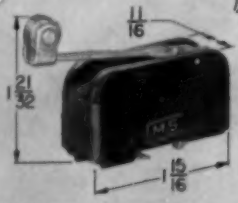




If it's switches . . .
precision switches . . .

DON'T EXPERIMENT

MICRO SWITCH has saved years of design and engineering time on such applications as these



2 switches help electronic gage sort small parts at from 60 to 120 per minute

Here's an electronic gage that sorts eight sizes of manually-loaded mica parts at high speed. The two switches are operated by timing cams and control the steps of the gaging cycle. The extremely accurate repeat operation of the MICRO SWITCH switches at high speed and for long periods of time was an important factor in their choice. There is a *right* switch for your application. Save your design and engineering time. Call MICRO SWITCH.

A Honeywell Mercury Switch gives trouble-free, dependable light control in lid of food freezer

Hidden in the lid of this food freezer, unaffected by the extreme cold or temperature variations, is this small HONEYWELL Mercury Switch. It operates by the action of tilting the freezer lid. If your application provides tilt motion and requires low operating force, it may be that a mercury switch is the best for you. Whatever your switch problem, MICRO SWITCH can provide the proper switch.

A complete line of snap-action and mercury switches

MICRO SWITCH provides a complete line of extremely reliable, small-size, high-capacity, snap-action precision switches and mercury switches. Available in a wide variety of sizes, shapes, weights, actuators and electrical characteristics. For all types of electrical controls.

MICRO SWITCH

A DIVISION OF MINNEAPOLIS-HONEYWELL REGULATOR COMPANY

In Canada, Leaside, Toronto 17, Ontario • FREEPORT, ILLINOIS

There's built-in durability in

WEIRKOTE

for all sheet-metal work

Wherever a durable zinc-coated material is needed for sheet metal fabrication, there's nothing better than Weirkote. Gutters, downspouts, ducts—no matter what the application, the name Weirkote on galvanized steel means uniformly high quality steel, tightly coated with zinc to resist cracking, peeling, flaking and corrosion. The high quality is assured by Weirton's modern mills and methods —and men.

When your specifications call for galvanized steel, call Weirton, and be sure.

Weirkote is available in coils and cut lengths: gauges 16 to 30 inclusive. Maximum width—42", maximum cut length—168". Weirkote can be obtained to fit any customer requirement. For standard roofing and siding it is guaranteed to conform to A.S.T.M. specification A361-52T.

PITTSBURGH LOCK

WEIRTON STEEL COMPANY

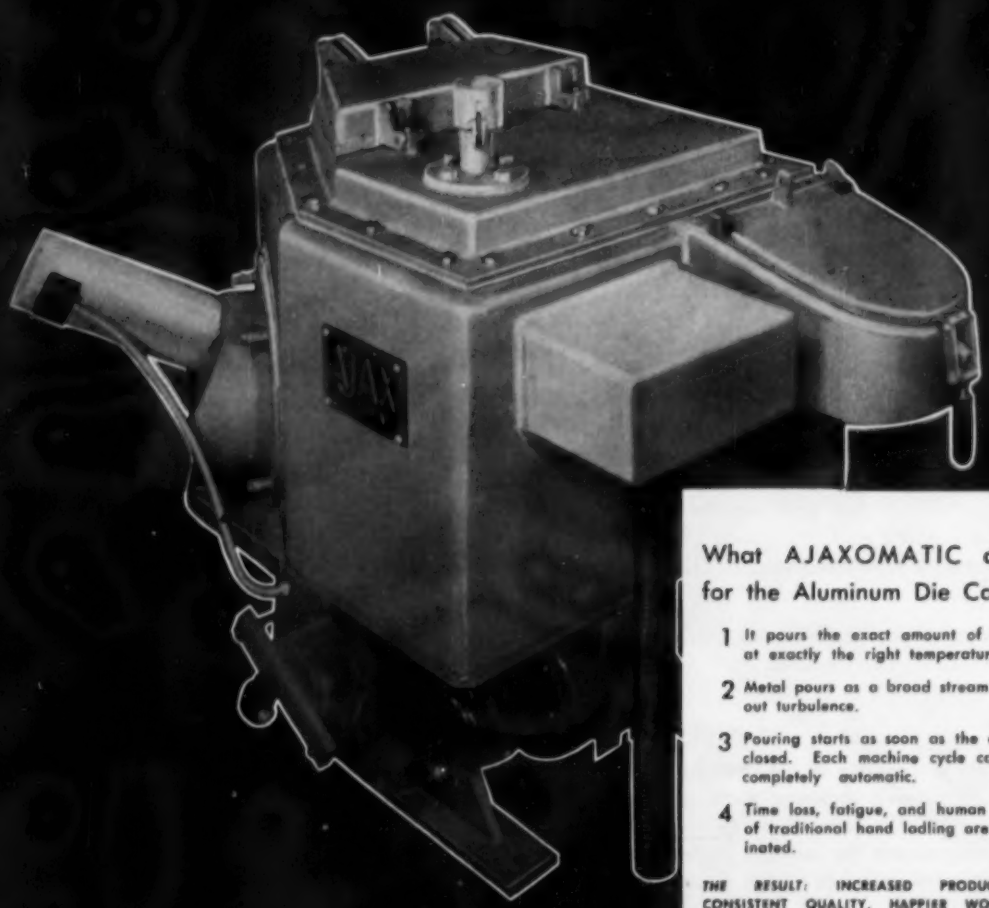
Weirton, West Virginia

NATIONAL STEEL CORPORATION

WEIRTON STEEL COMPANY

AJAXOMATIC

AN AUTOMATIC POURING UNIT FOR THE PRODUCTION OF ALUMINUM DIE CASTINGS



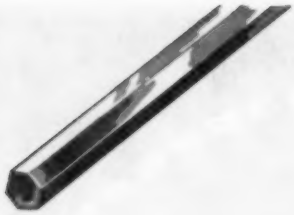
What AJAXOMATIC does for the Aluminum Die Caster

1. It pours the exact amount of metal at exactly the right temperature.
2. Metal pours as a broad stream without turbulence.
3. Pouring starts as soon as the die is closed. Each machine cycle can be completely automatic.
4. Time loss, fatigue, and human error of traditional hand ladling are eliminated.

THE RESULT: INCREASED PRODUCTION, CONSISTENT QUALITY, HAPPIER WORKERS.

AJAX ENGINEERING CORPORATION

TRENTON, N. J.



The Indispensable Ingredient....

WHAT AM I?

I attract buyers

I build sales

I provide job security

I cost nothing. Yet I should be a part of everyone's handiwork

I am an integral part of fine craftsmanship

EVERYBODY WANTS ME

I am your responsibility

I create friendship and good will

I inspire respect and confidence

I assure acceptance of your work

I am often not seen. But I am a most important ingredient

I AM *Quality!*

QUALITY is the guiding spirit of our research
the goal of our steel production
the tradition of our service

When you employ B&L Cold Finished Bars in your manufacture, this ***indispensable ingredient*** carries assurance of consistent steel uniformity, uncompromising adherence to tolerances, dependable machinability and suitable service of the fabricated end-products.

PRODUCTS

COLD DRAWN BARS
GROUND SHAFTING
SCREW STOCK
EXTRA WIDE FLATS
ALLOY BAR STEELS
SPECIAL SECTIONS

BLISS & LAUGHLIN, INC.

GENERAL OFFICES: HARVEY, ILLINOIS

SALES OFFICES
IN ALL PRINCIPAL CITIES

FOUR PLANTS:—

HARVEY, ILL.

DETROIT, MICH.

BUFFALO, N. Y.

MANSFIELD, MASS.

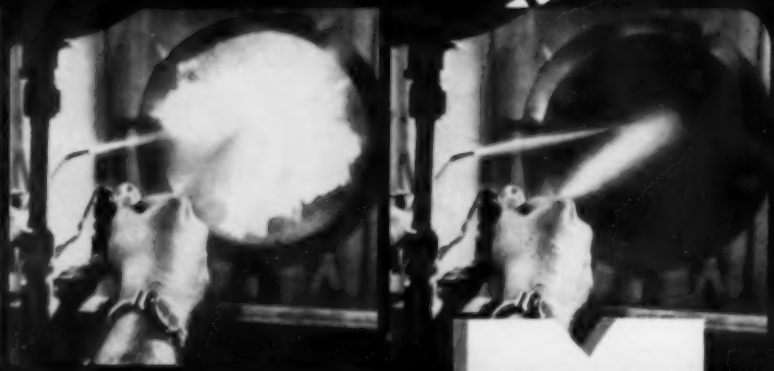
HYDRAULIC DANGER ZONE

Ordinary hydraulic fluid, escaping under pressure, can start a fire 40 ft. or more from a broken line! Is your plant safe? Here's how one firm protects men and machines inside the danger zone...

THE SPANG-CHALFANT PLANT of THE NATIONAL SUPPLY CO. switched to fire-resistant Pydraul F-9 hydraulic fluid after a line break involving flammable fluid caused a furnace shutdown, damaged electrical connections and lost 6 hours' production time. The plant operates this Hagan Rotary furnace continuously while a hydraulic boom containing 800 gallons of Pydraul moves white-hot billets in and out of 2250°F. heat. Recently, Pydraul's safety was proved when a ruptured hose sprayed fluid over hot billets and furnace. Result: No damage, no injuries and no time lost! *Pydraul: Reg. U. S. Pat. Off.*

PROOF OF PYDRAUL SAFETY

In photo at left, ordinary hydraulic fluid sprayed into oxyacetylene torch burns explosively. At right, Pydraul does not!



FREE! New 19-page technical booklet, "PYDRAUL F-9," gives facts on Pydraul tests, advantages, properties, uses and installation. Mail coupon to: Organic Chemicals Division, MONSANTO CHEMICAL COMPANY, Box 478-X-1, St. Louis 1, Mo.

MONSANTO
CHEMICALS – PLASTICS

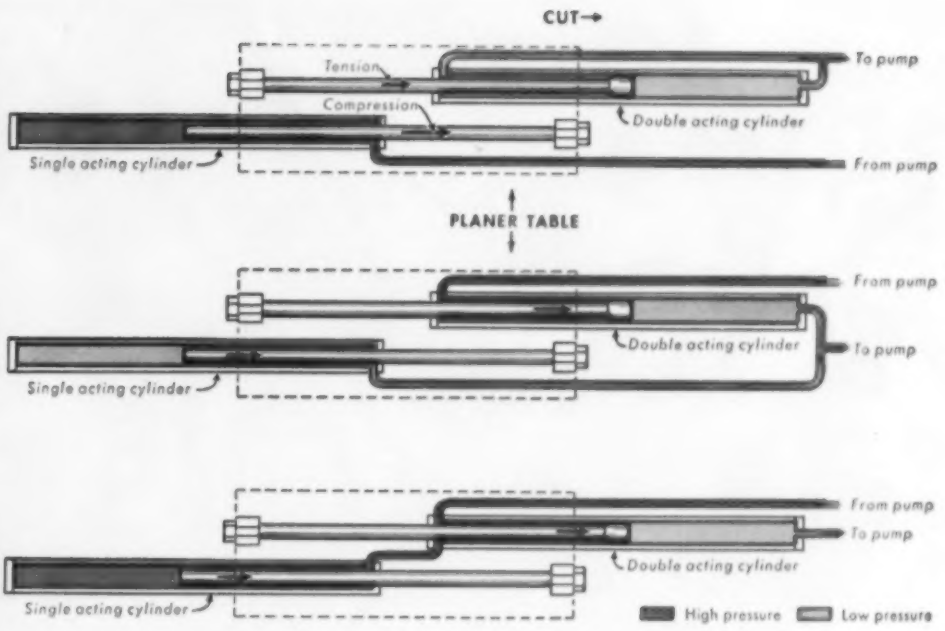
SERVING INDUSTRY, WHICH SERVES MANKIND

the triple circuit

high speed
LOW CUTTING FORCE

medium speed
MEDIUM CUTTING FORCE

low speed
HEAVY CUTTING FORCE



Infinite Speeds from 10 to 300 fpm. stepped through 3 distinct cutting force ranges.

Pendant control of range and cutting speed selection.

Maximum return speed regardless of cutting speed.

Quick reversals with minimum overtravel.

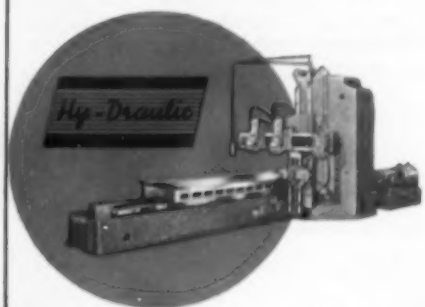
Suitable for prolonged use on short stroke work, as well as long work.

Hydraulic drive and feed has long provided efficiency and ease in the planing and shaping of metal.

Now a singular new dimension has been added to the proven efficiency and economy of Hydraulic planing. The new Triple Circuit provides the correct combination of cutting speed and required force, to most economically machine materials from the free cutting types to the toughest steel.

Many plants, large and small, who are evaluating their present equipment will find the Triple Circuit a significant development in their plans for plant modernization.

Get full details on this new Hy-Draulic achievement from any Rockfod Machine Tool Co. Representative, or write directly to us.



ROCKFORD MACHINE TOOL CO.
2500 KISHWAUKEE STREET • ROCKFORD, ILLINOIS

Good change for the West

MORE THAN 90 per cent of the new cars sold in California are assembled there. And today, a large proportion of these cars are being assembled with wheels made of Kaiser Steel.

This change-over to steel produced on the West Coast is being made because wheel manufacturers find they can depend on Kaiser Steel for unsurpassed quality... backed by prompt service and the fastest possible carrier delivery time.

By supplying this new market, the West Coast's only integrated independent steel plant is bringing more industry, more jobs, more wealth to the area it serves.

Kaiser Steel

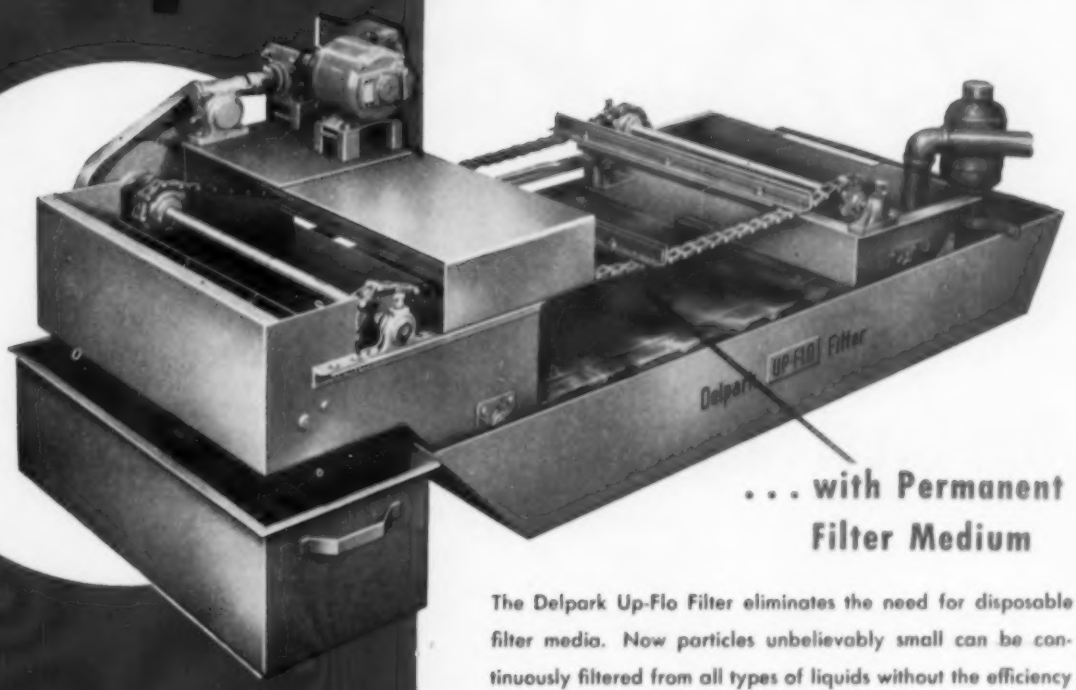
built to serve the West

PROMPT, DEPENDABLE DELIVERY AT COMPETITIVE PRICES • plates • continuous weld pipe • electric weld pipe • tinplate • hot rolled strip • hot rolled sheet • alloy bars carbon bars • structural shapes • special bar sections • semi-finished steels • cold rolled strip • pig iron • ingot molds • coke oven by-products • ferro-manganese • silico-manganese

For details and specifications, write: KAISER STEEL CORPORATION • LOS ANGELES • OAKLAND • SEATTLE • PORTLAND • PHOENIX • DENVER • TULSA • NEW YORK

Filters Fine Solids ...

Delpark UP-FLO Filter



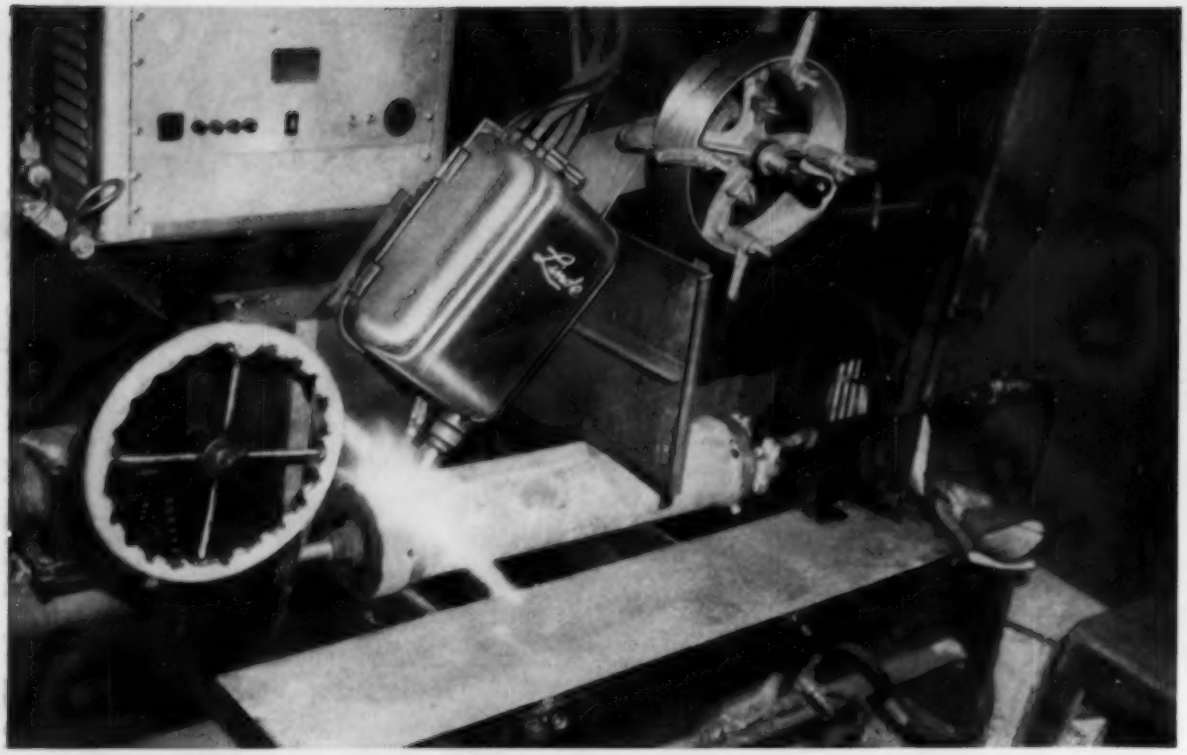
. . . with Permanent Filter Medium

- FULL FLOW
- HIGH EFFICIENCY
- HIGH CAPACITY
- FULLY AUTOMATIC
- SELF CLEANING
- BASIC GRAVITY PRINCIPLE

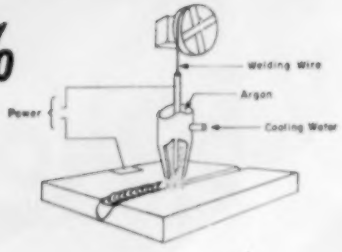
The Delpark Up-Flo Filter eliminates the need for disposable filter media. Now particles unbelievably small can be continuously filtered from all types of liquids without the efficiency of the filter being impaired. Heavier particles are removed by gravity and the upward flow of the liquid. Smaller fines held in suspension are removed by the permanent filter screen. The deposits are removed by automatically controlled flights which clean the fines from the permanent filter medium and at the same time remove the heavier deposits from the area below the screen. All material is deposited automatically in a tote box for disposal. Your Delpark field representative has the facts on this new development by Delpark engineering, producers of the finest in Industrial Filtration. *Write today for more complete information.*

Backed by more than 40 years experience in Industrial Filtration

INDUSTRIAL FILTRATION COMPANY, 99 INDUSTRIAL AVENUE, LEBANON, INDIANA



Sigma Welding...Cuts Costs 36%
Ups Steel Fabrication 93%



By shifting from manual arc welding to mechanized sigma welding, production of 31-in. long, 11-ga. steel condensers was almost doubled—costs were cut over a third—and unit quality greatly improved. These sigma welded condensers have been tested to hydrostatic pressures of 2,300 lb. per sq. in. with no sign of failure.

All completed condensers are subject to an air pressure test under water, and a supersensitive electronic leak detector . . . Rejects have been practically eliminated by sigma welding. Like many other products throughout industry, these condensers are being fabricated faster and more economically than ever before. Here are some sigma welding features—

- Uses any standard d.c. or constant potential power supply. With c.p., no control is necessary to maintain constant arc voltage, starting is faster and operations more efficient.
- Makes smooth welds in all type joints—on all commercially fabricated metals.
- Welding speeds exceed 100-in. per minute in many operations . . . And sigma welding joins metals up to ¼-in. thick in one pass. Start saving now, call your local LINDE representative for more information—and ask for Form 7942 "Modern Methods of Joining Metals."

Linde Air Products Company
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
Offices in Other Principal Cities
In Canada: DOMINION OXYGEN COMPANY
Division of Union Carbide Canada Limited, Toronto
The term "Linde" is a registered trade-mark of Union Carbide and Carbon Corporation.

Linde
Trade-Mark

CONTINUOUS BAR MILL

Designed and Built by

UNITED

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses, and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.

UNITED ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at: PITTSBURGH • VANDERGRIFT • YOUNGSTOWN • CANTON
WILMINGTON (LOBDELL UNITED DIVISION)

Subsidiaries: ADAMSON UNITED COMPANY, AKRON, OHIO
STEDMAN FOUNDRY AND MACHINE CO., INC., AURORA, INDIANA

UNITED *can serve you no matter where in the world you are*

"Steel from the Furnaces." Agnes Potter Lowrie depicts some of the basic steel products which provide the sinews of American industry. The I-beam, key piece in building construction. The angle iron. Wire rope. Railway track to carry the carriers of industry. The can, universal container for foods and liquids. And in the background, sheet steel, gleaming symbol of strength and durability. Limited edition of 15 x 18 full-color prints available. Copy on request.

The Fine Art of Steel Making #VI

Too often, estimates of the steel industry concentrate upon our overwhelming productive capacity. Yet more than a little credit is due another American talent—the ingenuity of research coupled with the ever-readiness of steelmen to adopt new and better products and processes.

As recently as World War II, some of our largest mills were fearful of shutdowns because palm oil, then considered the essential lubricant for cold rolling tin plate, was obtainable only from foreign sources and had to be imported across U-boat-infested waters.

Research tackled the problem. Three years ago Ironsides announced Palmoshield as the first domestic replacement for imported palm oil. Within six months two-thirds of our major tin plate mills were using or testing it, often with remarkable results. For example, one company stepped up production 15% with no additional investment, no increase in labor, and no change in mill operation.

Recognized as today's most significant advance in lubrication, Palmoshield offers five distinct advantages:

1. Produced in the heart of the steel industry. Users need not stockpile.

2. Made from freely available domestic materials.

3. Subject to exact chemical control — free fatty acid content to within ½%.

4. Price is not artificial, but fluctuates freely with the domestic fat market.

5. Proved in production to deliver increased tonnage at less cost.

Ironsides research, which developed Palmoshield, is geared to the future. A flexible team — the "custom tailors" of lubrication — Ironsides engineers are available for technical assistance on special problems of any nature or size.

A letter will summon them without obligation. Address The Ironsides Company, Columbus 16, Ohio.

SHIELD PRODUCTS

Ironsides

By the makers of Palmoshield • "the palm tree that grows in Ohio"

Now you can make WELDED TUBES

faster, better, at lower cost, from –

STEEL

STAINLESS

BRASS

COPPER ALLOY

ALUMINUM

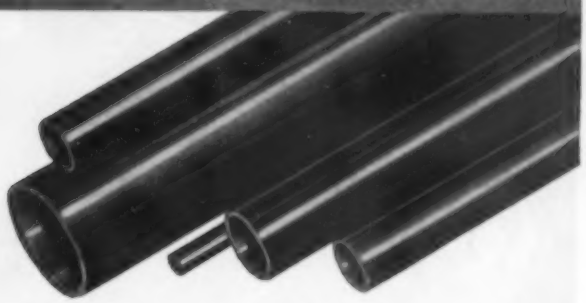
MAGNESIUM

NICKEL

INCONEL

MONEL

NO



Within the last few years rapid strides have been made by Yoder in widening the scope and raising the speed of cold process electric-weld pipe and tube making. In tube mills perfected by Yoder many non-ferrous metals can be induction-welded in gauges up to .154" and at speeds approaching those attained in resistance welding steel tubes.

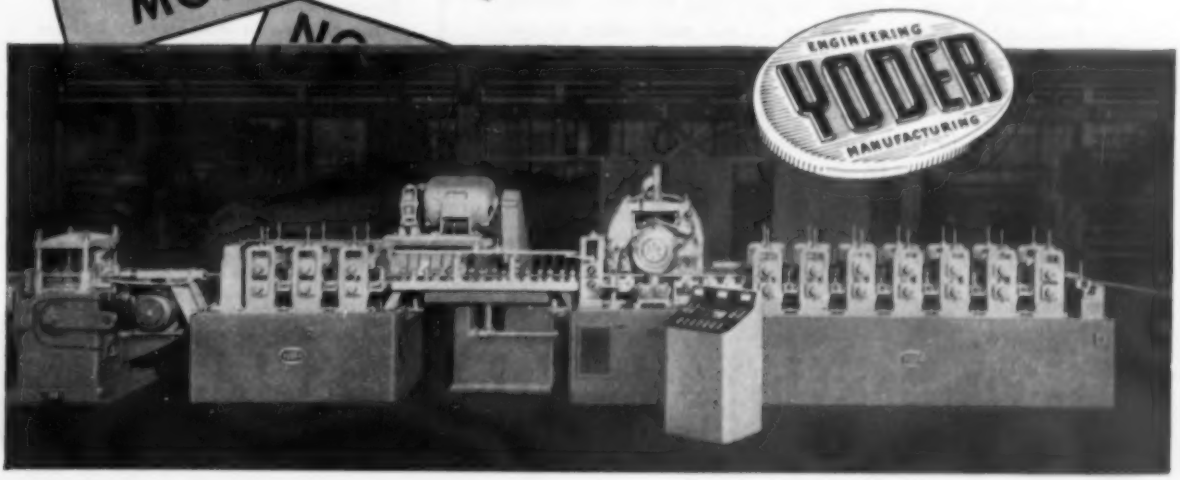
Further, speeds up to 250 fpm are reached in induction-welding steel tubing in the same gauges.

New, compact Yoder "4-in-1" Welding Transformer is the last word in resistance-welding steel pipe and tubing in sizes up to 24" diameter.

More specific information, literature and estimates on request, without obligation on your part.

THE YODER COMPANY

5502 Walworth Ave. • Cleveland 2, Ohio



Gray Iron mounting plate, for use on a water circulating pump, was cast to shape with holes cored.

Casting or steel plate ...which costs less?

This pump mounting plate when it was flame cut from hot-rolled plate and drilled, cost $1.92.

Then it was redesigned in Gray Iron

Now it costs $1.33 . . . a saving of 30%. The holes are cored and the only finishing on the casting is surface grinding on both sides.

Economy is only one reason for redesigning parts in Gray Iron. This versatile metal can give you strength, rigidity, wear and corrosion resistance . . . and many other unique engineering advantages.

Call your nearest Society member foundry and the full facilities of this association will be available to help you. Or, write direct to Gray Iron Founders' Society, Inc., National City-E. 6th Bldg., Cleveland 14, Ohio, for helpful technical and business information.

MAKE IT BETTER WITH GRAY IRON

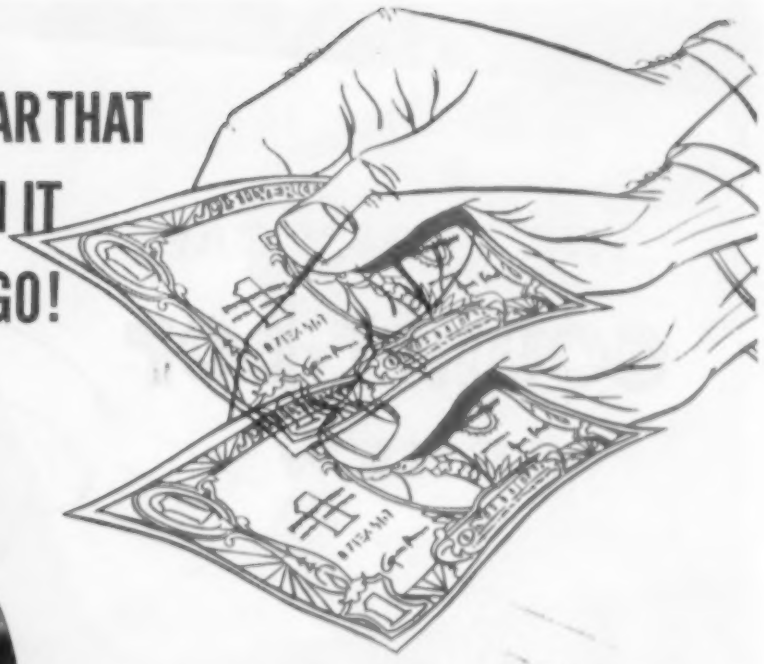
This symbol assures you the most for your casting dollar

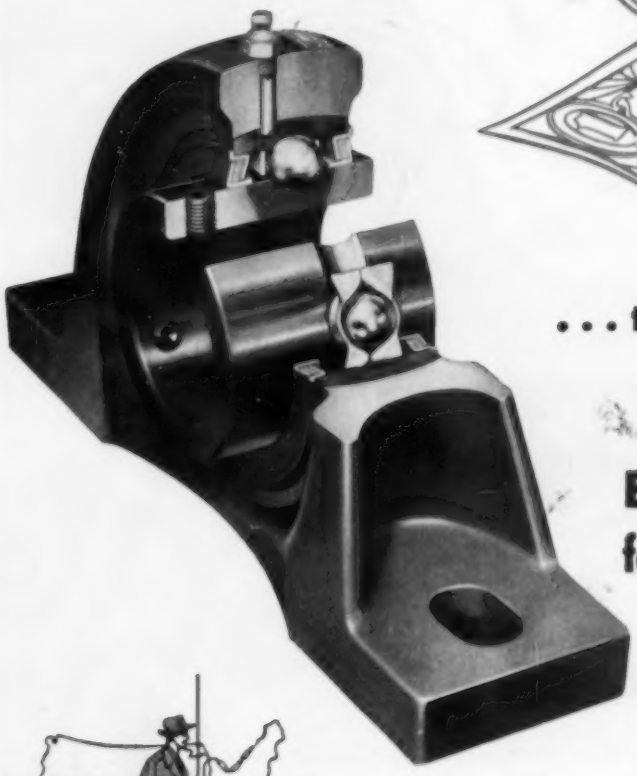
Here's why it pays to call in one of the more than 500 leading foundries displaying the Society symbol:

- The most recent technical and business information is available to each member through the Society to help you design better products at lower cost.
- The use of sound cost accounting procedures is recommended and encouraged among Society member foundries, assuring full value for your casting dollar.
- Improved castings result from the advanced techniques and the high sense of responsibility of Society members.

GRAY IRON FOUNDERS' SOCIETY

HERE'S ONE DOLLAR THAT BUYS MORE THAN IT DID 25 YEARS AGO!





. . . the dollar you invest in SEALMASTER BALL BEARING UNITS for products you build or buy!

Purchasing power of the dollar may have gone the way of the five cent cigar, but year after year SEALMASTER Bearing Units give you more and more for your component purchasing dollars.

SEALMASTER research and engineering continues to bring you the latest advances in bearing design and manufacture. SEALMASTER Bearing Units contain a combination of patented features you will find in bearing units of no other make.

SEALMASTER has a complete line of bearing units to answer all your requirements for outstanding bearing performance.

Factory Representatives and Dealers Located in All Principal Cities

SEALMASTER BALL BEARING UNITS

SEALMASTER BEARINGS A DIVISION OF STEPHENS-ADAMSON MFG. CO. • 97 RIDGEWAY AVE., AURORA, ILLINOIS

THE FERRY CAP
countr-bor
SCREW

A NEW, REVOLUTIONARY DESIGN FOR SOCKET HEAD SCREW APPLICATIONS

OFFERING THESE NOTEWORTHY ADVANTAGES:

1. Takes standard 12-point socket wrench.
2. External wrenching instead of internal.
3. Stronger—more gripping surface.
4. Permits greater wrenching torque.

Packaged goods being readied for distributors

In brief—a quality product which will do everything required of socket head screws—and more. For all counterbore applications.

Wherever the Ferry Cap Countr-Bor Screw has been tried, users are enthusiastic—saying that these screws are a service man's dream and the best development in socket screws in recent years. They will help you lick tough assembly problems where socket screws are required.

We shall be glad to send samples, prices and complete information promptly upon request.

Ferry Cap Countr-Bor Screws
PATENT APPLIED FOR
MANUFACTURED SOLELY BY

THE FERRY CAP & SET SCREW COMPANY
2159 Scranton Road • Cleveland 13, Ohio

you can double the life of your peels with UNIVAN castings

On record are cases where UNIVAN peels are lasting two to three times the life of carbon peels . . . and in some cases even longer. For UNIVAN steel, compared with carbon steel, has greater resistance to firecracking and greater resistance to torsional twist and shock.

When you consider what this longer life can mean to you in terms of fewer castings, less machining (the cost of machining may equal the original cost of the casting), and less downtime . . . the net result could be more than a 50% saving.

So check the life of your peels. And if you're not satisfied, give UNIVAN peels a chance to prove how they can perform on your toughest jobs. Likewise, for your charging boxes, bearing covers, couplings and spindles, tongs and levers . . . as all of them are available in this special alloy steel.

Write us for complete information. Or send your blueprints for a prompt quotation on your requirements . . . for castings in the rough or completely machined.

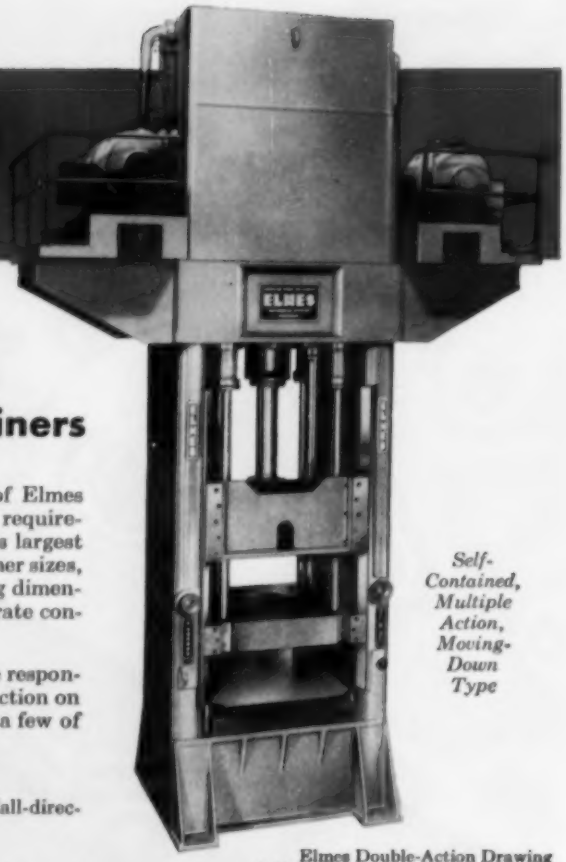
BLAW-KNOX

BLAW-KNOX COMPANY

Union Steel Castings Division • Pittsburgh 1, Pennsylvania

UNION PRODUCTS: charging boxes • peels • bearing covers • slag pots • tongs and tong levers • universal couplings and spindles • gears and pinions • ingot cars • charging box cars • special UNIVAN and ARMOR steel castings

ELMES *Double-Action* DRAWING & FORMING PRESS



Self-Contained, Multiple Action, Moving-Down Type

"Custom Built" for deep drawing of large high-pressure gas containers

The press shown at right is a typical example of the work of Elmes engineers in designing hydraulic equipment to meet special requirements. This press is located in the plant of one of the nation's largest producers of high-pressure gas containers. A variety of container sizes, made of special high strength alloy steel, are drawn to exacting dimensional specifications. The press must maintain uniformly accurate concentric diameters and wall thickness in the part.

Many important Elmes construction and control features are responsible for maintaining the high quality and efficiency of production on this type of heavy-piece, deep-draw work. Following are just a few of these features:

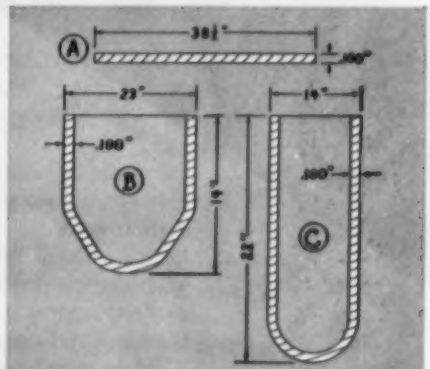
- **Ring key positioning,** assuring constantly maintained "all-directional" alignment of press crown, bed, and housings.
- **Extra-long guide ways for main and blankholder slide,** counteracting all tendency of the slide to deflect during pressing operation.
- **Provision for extra-fine gib adjustment and slide alignment** obtained by use of non-metallic facing on the gibs and hand-scraped bearing surfaces.
- **Press equipped with a separate pumping unit** for powering the blankholder system. Assures maintenance of the blankholder pressure irrespective of main slide movement.
- **Individual corner pressure adjustment** provided for blankholder slide.

Elmes craftsmanship in press design and construction will assure *you* of press performance at its *best*. Recommendations and cost estimates will be promptly supplied, and entirely without obligation, of course. See your Elmes Distributor, or write to us direct.

Standard or Custom Built Presses for

DRAWING AND FORMING
FORCING BENDING
STRAIGHTENING
TUBE REDUCING FORGING
COINING DIE SINKING ETC.

Elmes Double-Action Drawing & Forming Press, equipped with die cushion. Main platen capacity 300 tons, blankholder capacity 100 tons. For single-action operations of main platen and blankholder, capacities are combined for a total of 400 tons.



Cross-section views showing stages in production of high-pressure gas container bodies on the Elmes Double-Action Press illustrated above. The blank and first draw are produced in a single operation. (A) Circular blank. (B) First draw. (C) Final draw.

ELMES

AMERICAN STEEL FOUNDRIES • ELMES ENGINEERING DIVISION
1175 Tennessee Avenue . . . Cincinnati 29, Ohio

HYDRAULIC PRESSES & EQUIPMENT

METAL-WORKING PRESSES • PLASTICS MOLDING PRESSES • PUMPS • ACCUMULATORS

THE TEETH in this drag line bucket now are fabricated from 3" sections of USS "T-1" Steel. Teeth are flame-cut, bolt holes are drilled, then teeth are water quenched and tempered to a surface hardness of 388 to 401 Brinell. No all-over machining is required, as it was previously. Flame cutting does not cause steel to crack. "T-1" cuts costs, saves time, improves performance.

How USS "T-1" Steel in Drag Line Bucket Teeth increased service life ten times

This hefty drag line is used to break and load ferromanganese which is made by the Blast Furnace Department of U.S. Steel's Duquesne Works. Ferromanganese is extremely hard and dense, so the bucket teeth must have exceptional resistance to impact abuse and abrasion.

When we bought this machine, the manufacturer used the best steel then available for the job. But still the teeth broke easily – and lasted for only 4 to 8 hours of operation. Replacement down time was frequent and expensive.

Just as an experiment, we tried our new "T-1" Steel in this rugged application. It worked beautifully. Instead of 8 hours, we are getting *80 hours* of service from each set of teeth – ten times more. Down time and replacement costs are about *a tenth* of what they used to be. Naturally we'll continue to use "T-1" Steel in this job, in the entire bucket as well as the teeth.

USS "T-1" Steel can cut costs for you in a wide variety of applications. Write for detailed facts and figures.

USE "T-1" AT HIGH TEMPERATURES. New USS "T-1" Steel has good creep rupture strength up to 900° F. It is being used in heavy-duty parts that operate at high temperatures.

USE "T-1" AT LOW TEMPERATURES. This same steel is amazingly tough at sub-zero temperatures. In pressure vessels, it has survived impacts of 2,000,000 ft. lbs. at 38 degrees below zero F. In addition, it has good resistance to impact abrasion.

USE "T-1" TO CUT FABRICATING COSTS. You have a yield strength of 90,000 psi. in "T-1" yet you can weld or flame cut this steel without pre- or post-heating. Your welds will develop the full 90,000 psi. And you can fabricate parts either in the shop or the field—wherever it is more convenient and less costly. With "T-1" Steel you can save money or improve design—sometimes both—in bridges, pressure vessels, heavy-duty trucks, excavating machines, mine cars, high speed rotating machines, steel mill equipment, and stamping and forging presses.

UNITED STATES STEEL CORPORATION, PITTSBURGH • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS "T-1" CONSTRUCTIONAL ALLOY STEEL

USS

S-203

UNITED STATES STEEL

Practical service training at Honeywell's school...

makes your instrument men more valuable

YOUR instrument maintenance men can get a real education in the most up-to-date methods for servicing instruments, at Honeywell's Training School. Any organization which uses Honeywell instruments can send maintenance personnel to this school. Tuition costs you nothing, for this school is maintained as a "plus-value" service to Honeywell customers.

Thousands of technicians have either started or augmented their instrument knowledge here. A variety of courses is available, to fit men for the particular kind of maintenance problems they may encounter in their specific jobs. The comprehensive course . . . one of the most complete and intensive offered anywhere . . . covers about thirteen weeks. Other courses cover five weeks and less, to offer condensed instruction of either a basic or "refresher" nature to men who can't be spared for extended periods.

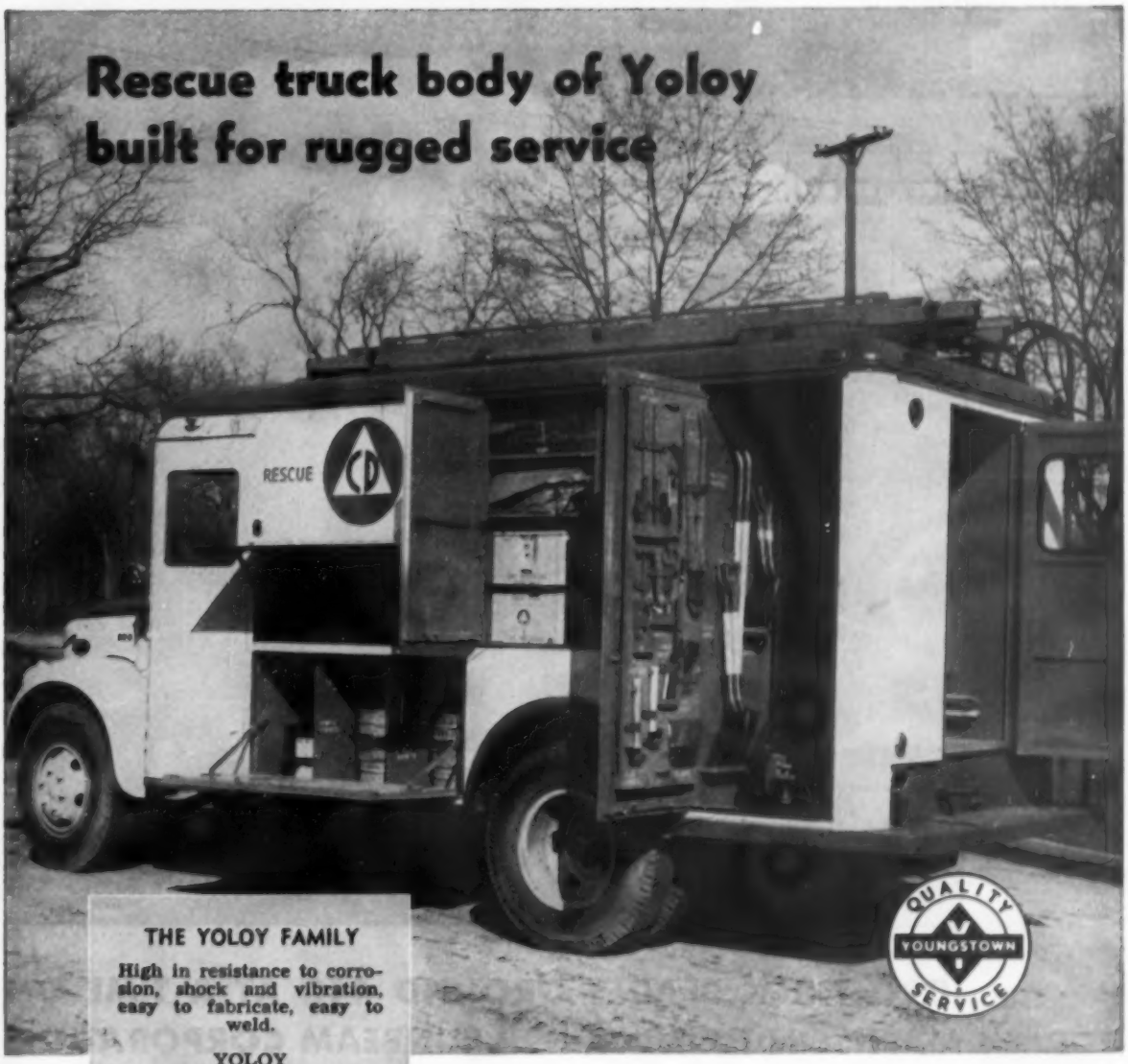
There's nothing academic about this school. The emphasis is placed on practical knowledge. Theory through lectures and textbook study is liberally supplemented by laboratory sessions and actual bench work on all types of instruments and related equipment.

One caution: classes have to be limited to assure thorough attention to all students, so make reservations in advance. Your local Honeywell office will be glad to make arrangements. Call today . . . it's as near as your phone.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*,
Wayne and Windrim Avenues, Philadelphia 44, Pa.

MINNEAPOLIS
Honeywell
BROWN INSTRUMENTS
First in Controls

Rescue truck body of Yoloy built for rugged service



THE YOLOY FAMILY

High in resistance to corrosion, shock and vibration, easy to fabricate, easy to weld.

YOLOY
(Nickel-Copper)
Low Alloy High Strength Steel

YOLOY E
(Nickel-Chrome-Copper)
Low Alloy High Strength Steel

YOLOY M
(Manganese-Copper)
High Strength Steel

This civil defense truck must be ready to go under all conditions. To overcome unforeseen emergencies the Yoloy Family of steels is used advantageously in the construction of its all steel body.

The Yoloy Family of high strength steels have proven themselves to be extra ordinarily tough resistant to corrosion abrasion and wear. Their extra strength permits lighter construction with consequent valuable reduction in dead weight. That's why Swift All-Steel Body Co., Inc., Saginaw, Michigan, specified Yoloy "M" and Yoloy "E" for the light, strong body framing in this rescue truck.

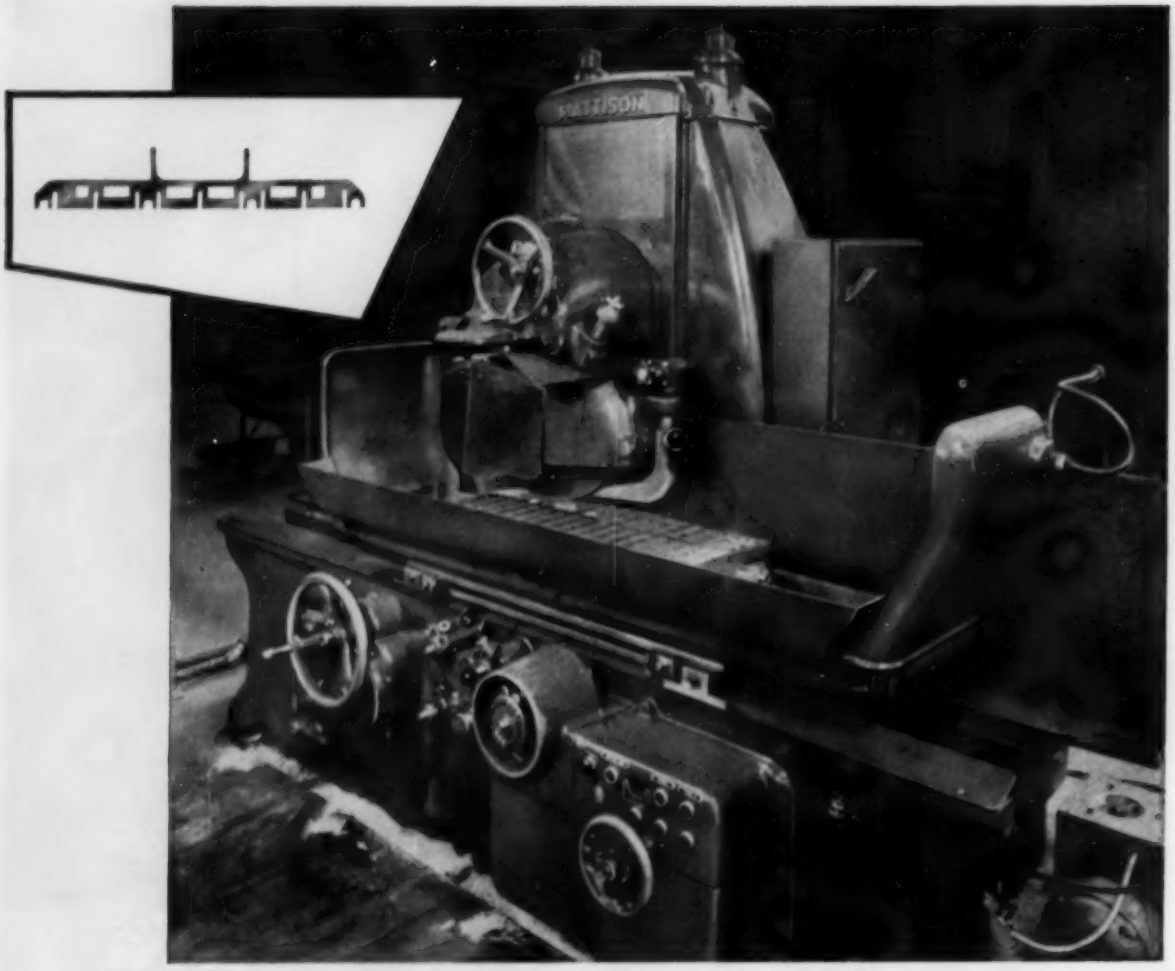
Our District Sales Office near you is ready to supply information and service on the specific steels in the Yoloy Family best fitted to meet your requirements.

Youngstown

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon Alloy and Yoloy Steel*

General Offices: Youngstown, Ohio - District Sales Offices in Principal Cities

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - BAR SHAPES - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - RAILROAD TRACK SPIKES



.020 THICK BLADES GROUND 440 AT A TIME ON MATTISON GRINDER FOR SUNBEAM CORPORATION

Here is an unusual grinding job at the Sunbeam Corporation Plant being performed rapidly and accurately with the Mattison Grinder shown above. 440 Shavemaster blades only .020″ thick are ground at one time at a considerable saving in time over previous method.

With the Mattison High-Powered Precision Surface Grinder you have the high power and rugged, double-column construction for rapid stock removal; large capacity which means more pieces of work per load; and the precision and sensitivity necessary for fine, high-quality finish and accuracy to close limits.

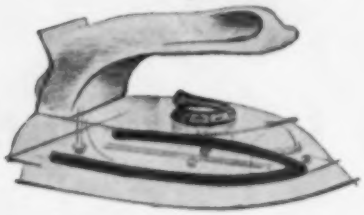
This combination not only enables you to step up production on small parts but permits grinding large work which previously could not be handled. Send for free circular containing complete information as well as numerous other examples of work ground on the Mattison Grinder.

MATTISON MACHINE WORKS

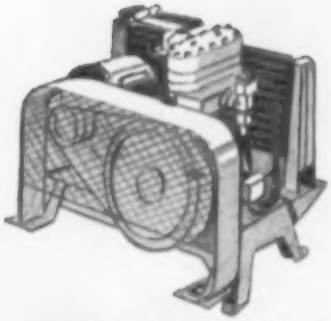
ROCKFORD · ILLINOIS

BUNDY TUBING COMPANY

FROM *the Bundy Sketchbook*
TO *jog a designer's imagination*



SHEATH FOR HEATING ELEMENT IN HAND IRON

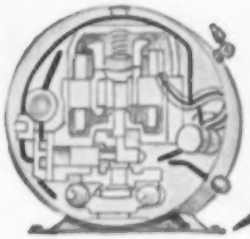


SERPENTINE COILS IN CONDENSER UNIT

REMARKS Designing a new product? Or redesigning an old one? Why not avoid delays, expense by turning your tubing headache over to our engineering experts. They offer you a wealth of problem-solving experience, plus the priceless bonus of Bundyweld, the only tubing double-walled from a single strip (see below).

WRITE today for catalog or for help in developing your tubing application.

BUNDY TUBING COMPANY
DETROIT 14, MICHIGAN



REFRIGERATOR COMPRESSOR LINES

WHY BUNDYWELD IS BETTER TUBING

Bundyweld starts as a single strip of copper-coated steel. Then it's . . .

continuously rolled twice around laterally into a tube of uniform thickness,

and passed through a furnace. Copper coating fuses with steel. Result . . .

Bundyweld, double-walled and brazed through 360° of wall contact.

BUNDYWELD TUBING®

DOUBLE-WALLED FROM A SINGLE STRIP

Leakproof
High thermal conductivity
High bursting point
High endurance limit
Extra-strong
Shock-resistant
Ductile

Lightweight
Machines easily
Takes plastic coating
Takes plating
Bright and clean
No inside bead
Uniform I.D., O.D.

Bundy Tubing Distributors and Representatives: ***Cambridge 42, Mass.:*** Austin-Hastings Co., Inc., 226 Binney St. • ***Chattanooga 2, Tenn.:*** Poirson-Deakins Co., 823-824 Chattanooga Bank Bldg. • ***Chicago 32, Ill.:*** Lapham-Hickey Co., 3333 W. 47th Place • ***Elizabeth, New Jersey:*** A. B. Murray Co., Inc., Post Office Box 476 • ***Los Angeles 58, Calif.:*** Tubesales, 5400 Alcoa Ave. • ***Philadelphia 3, Penn.:*** Rutan & Co., 1717 Sansom St. • ***San Francisco 10, Calif.:*** Pacific Metals Co., Ltd., 3100 19th St. • ***Seattle 4, Wash.:*** Eagle Metals Co., 4755 First Ave., South ***Toronto 5, Ontario, Canada:*** Alloy Metal Sales, Ltd., 181 Fleet St., E. • **Bundyweld nickel and Monel tubing are sold by distributors of nickel and nickel alloys in principal cities.**

don't trust to luck...

when you can be sure with CUT STEEL!

Don't buy conventional types of abrasives and trust to luck to get exceptional cleaning results. For there's a revolutionary, new type of abrasive—CUT STEEL—that cleans like no other abrasive has ever cleaned! It isn't air-formed, cast or made from wire. Instead, it's cut from high quality, alloy steel. And, it does an incredibly fine job of cleaning!

CUT STEEL gives castings and forgings a gleaming, natural metallic appearance. Cleans up to twice as fast as other abrasives. Outlasts other abrasives. Holds maintenance costs to a minimum. Yet, Grade "A" CUT STEEL ***sells for less than most cast steel shot*** and Grade "B" ***costs no more than most malleable shot!***

So, don't trust to luck—change over to CUT STEEL and be ***sure*** of better, more economical cleaning. Send for samples, prices or a trial order—TODAY!

Sooner or later, you too, will change to CUT STEEL!

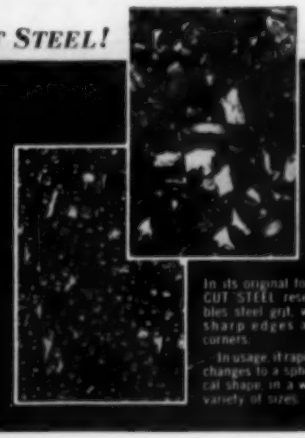
CUT STEEL
ABRASIVE

ANNEALSHOT and SUPER-ANNEALSHOT

PRODUCTS OF

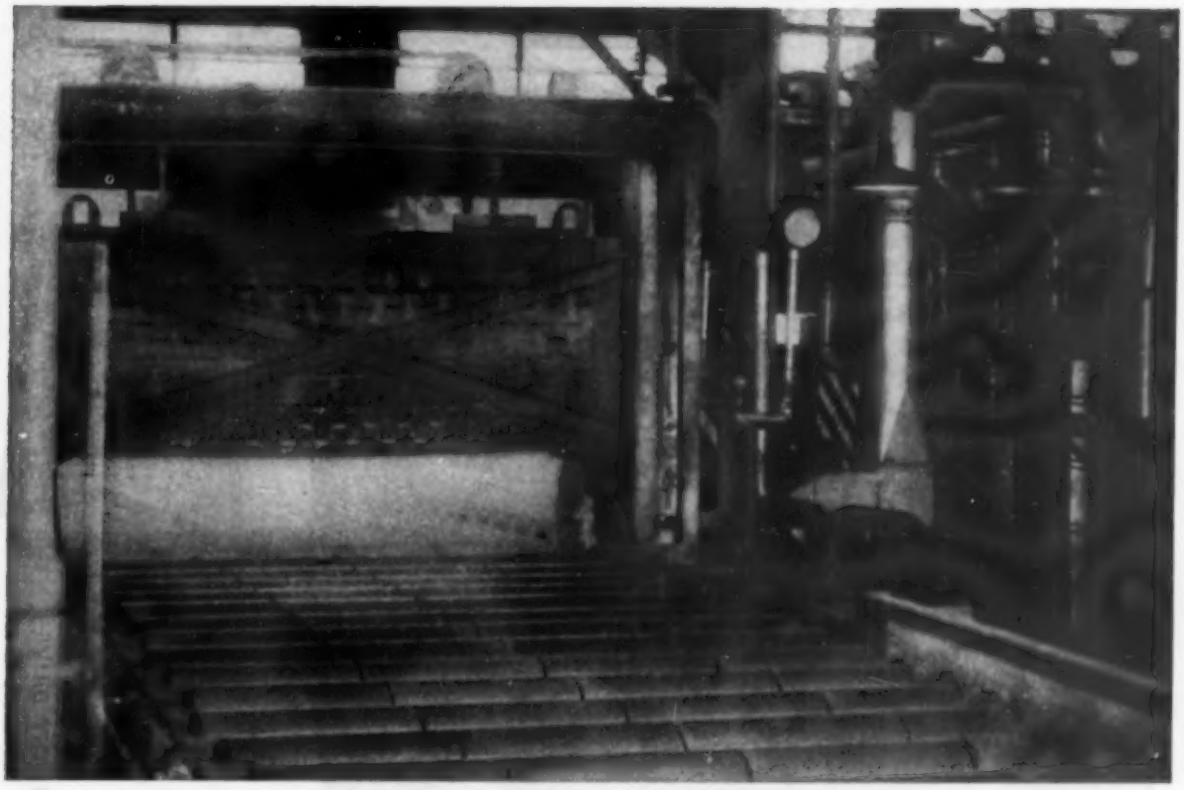
METAL BLAST, INC.

872 EAST 67th STREET • CLEVELAND 3, OHIO



In its original form CUT STEEL resembles steel grit with sharp edges and corners.

In usage it rapidly changes to a spherical shape in a wide variety of sizes.



3800 hours at 2150 deg. F.

The HASTELLOY alloy X rollers in this gas-fired heating furnace have been in use for 3800 hours. They operate in a neutral atmosphere at 2150 deg. F. They are also subjected to mechanical and thermal shock as they come in contact with the cold sheet metal being heated. A recent inspection showed that the HASTELLOY alloy X parts are still in excellent operating condition.

The rollers were fabricated from HASTELLOY alloy X sheet, 3/16 in. thick. The sheets were formed into shells 7½ in. in diameter and six feet long. The shells were then slipped over 2-in. water-cooled pipe, and refractory material was packed into the space between the shells and shafts. Spiders on the shafts were used to keep the shells concentric.

HASTELLOY alloy X has excellent forming characteristics, and good creep and stress-rupture properties. At 1200 deg. F. this nickel-base alloy has an ultimate strength of 82,000 lb. per sq. in., and even at 1500 deg. F. the ultimate tensile strength is 48,000 lb. per sq. inch. Its outstanding resistance to oxidizing, reducing, or neutral atmospheres makes it especially useful in furnace applications.

For information on prices, sizes, and properties of HASTELLOY alloy X write to any of the district sales offices listed below.

"Hastelloy" and "Haynes" are registered trade-marks of Union Carbide and Carbon Corporation.

HAYNES TRADE-MARK ALLOYS

HAYNES STELLITE COMPANY

A Division of Union Carbide and Carbon Corporation

UCC

General Offices and Works, Kokomo, Indiana

Sales Offices

Chicago · Cleveland · Detroit · Houston · Los Angeles · New York · San Francisco · Tulsa

This Photo is One-Third Actual Size...

OF A COMPLETE VEELOS V-BELT INVENTORY IN THE O, A, B AND C WIDTHS!

Put an end to endless space and inventory problems. Four reels of Veelos adjustable v-belt replace up to 316 different sizes of endless belts... and take up a space of only 16 inches square.

VEELOS
THE BALANCED
LINK V-BELT

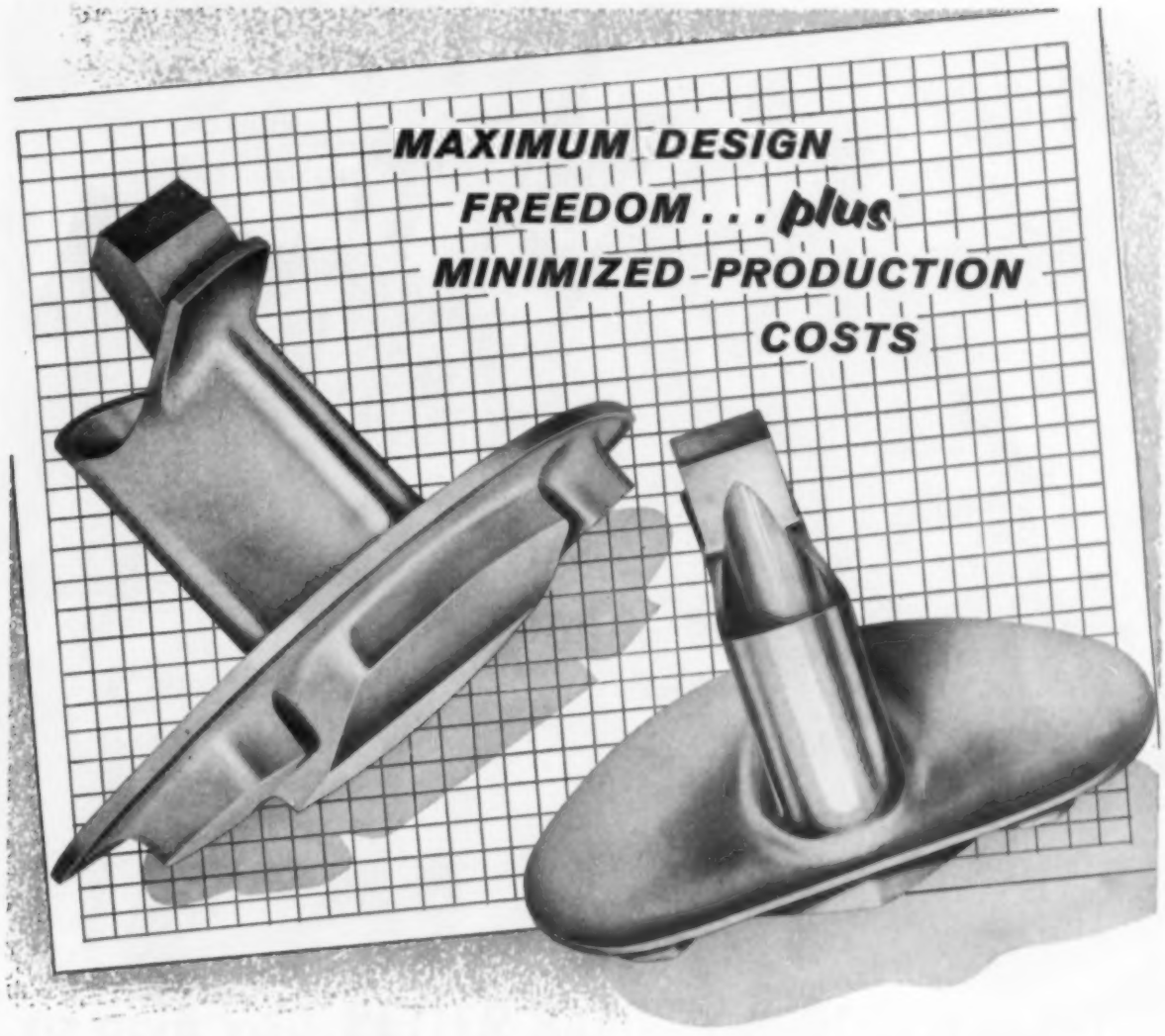
Over 350 distributors throughout the country. Veelos is known as Veelink outside the United States.

ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

WRITE FOR A FREE COPY... of the Veelos Data Book. It's packed with valuable engineering data complete with illustrations. Send for your copy today.

MANHEIM MANUFACTURING & BELTING CO.
613 Manheim St., Manheim, Pa.

001



Intricate Arwood Investment Cast Parts Save as Much as 77%

Because of the vast design freedom permitted by the Arwood investment casting process, applications of Arwood investment castings are virtually unlimited. Shapes impractical to obtain by conventional methods can now be produced economically . . . with many former sub-assembly jobs being cast as single, rigid units. The applicability of unmachinable metals is an additional economy factor.

Our engineers will be pleased to go over your parts problems with you and help cut your own costs. Why not submit parts or prints to us for quotations? Consultation is free of obligation, of course.

Write for free literature describing the investment casting process.

CASE STUDY

DESIGNATION: Strut for jet aircraft engine.

METAL: Timken 1722A Steel.

PARTS: Designed and cast as a single unit.

QUALITY CONTROL: 100% X-ray and magnaflux inspected. Chemical and physical affidavits furnished. Test bars submitted.

ADVANTAGES: Only the investment casting process could produce this complex part as a single unit, meet the exacting aircraft quality requirements, and reduce the over-all cost to the customer.

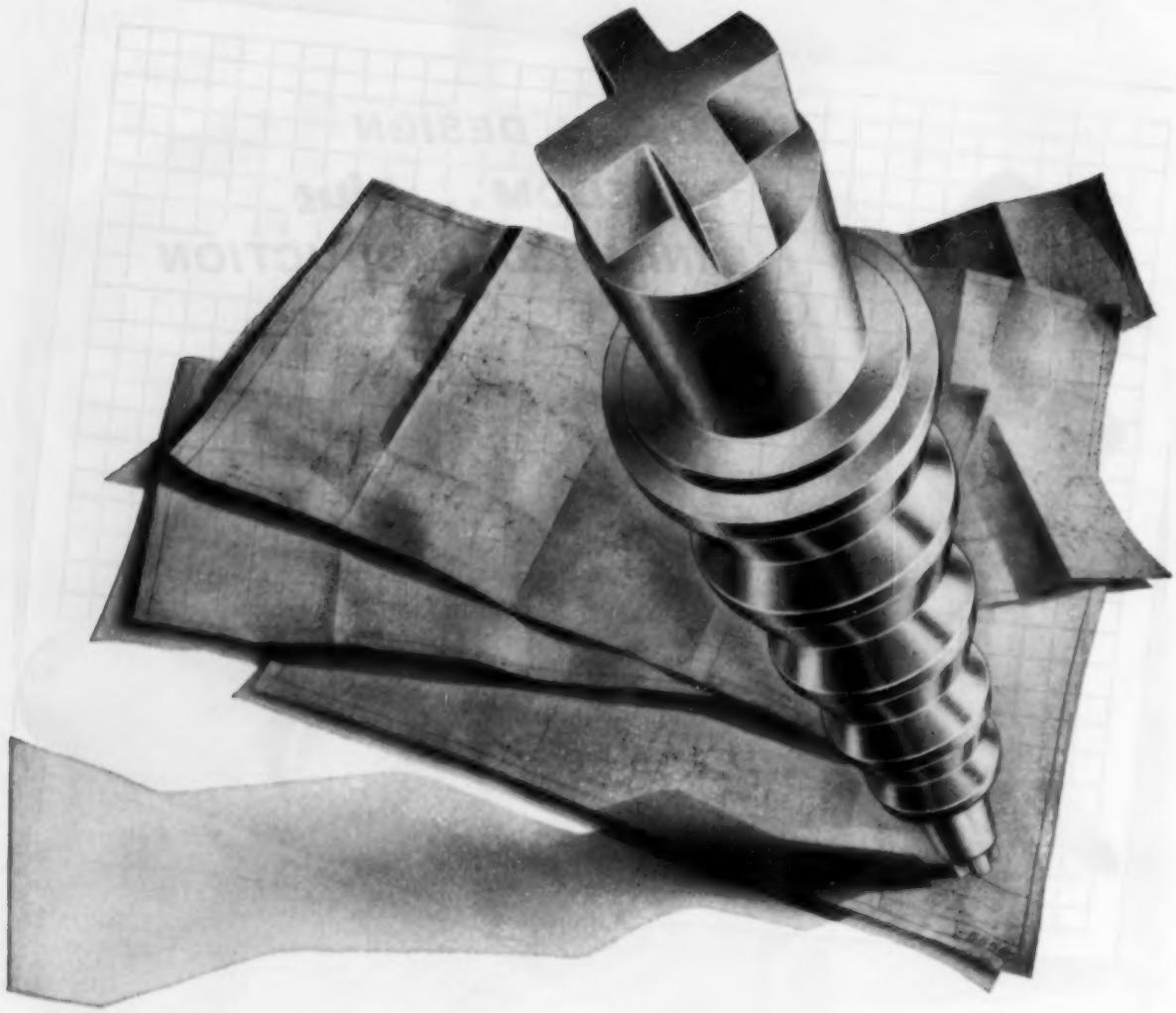
ARWOOD

PRECISION CASTING CORP.

66 WASHINGTON STREET • BROOKLYN 1, N. Y.

PLANTS: Brooklyn, N. Y.; Groton, Conn.; Tilton, N. H.; Los Angeles, Calif.

Visit us at the Western Metal Show—Booth 271



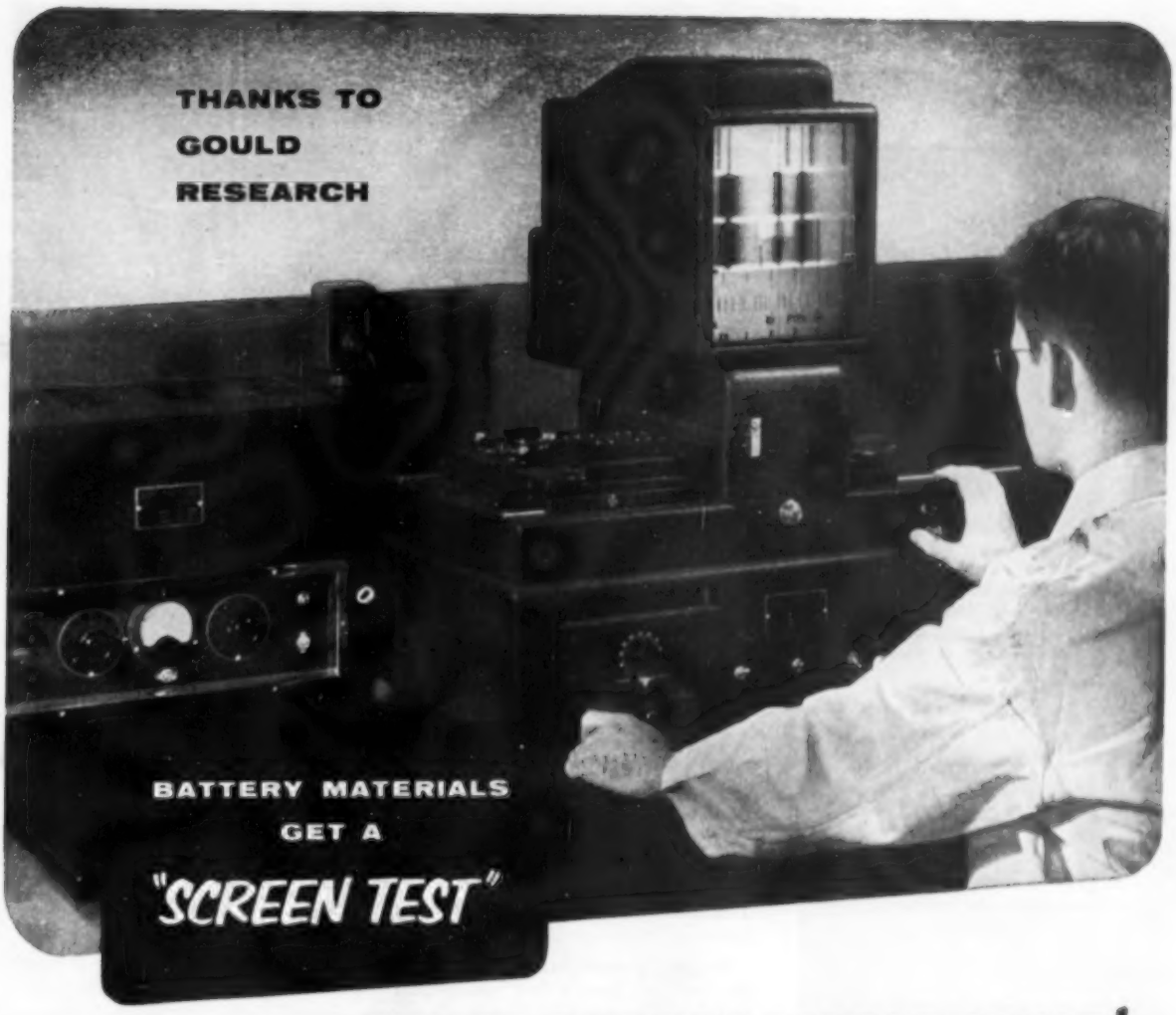
Planned for Precision

From the drawing stage of a roll to its final inspection, National always keeps in mind the importance of precision . . . and that is reflected in every roll that National produces. We know that you must have precision in rolls to give your customers precision in rolled metals. So for precision rolls to your specifications, call on National.

THE NATIONAL ROLL & FOUNDRY CO.

Avonmore, Pennsylvania

Specialists in Iron, Alloy Iron and Steel Rolls and Castings, Steel Armor Castings

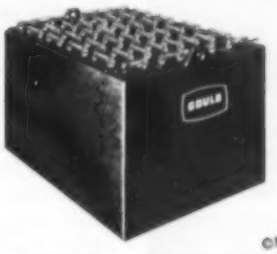


TO GIVE YOU BETTER BATTERY PERFORMANCE!

By projecting spectrographic film records on the screen of the Densitometer shown above, Gould research engineers can determine almost instantly the composition of battery metal samples and predict their performance under actual service.

Such "screen tests" together with other test procedures make sure that you get batteries with predictable performance and longer service life.

Gould research has taken the guesswork out of battery-making. Take the guesswork out of battery-buying by choosing GOULD!



America's Finest!
GOULD
Industrial Truck Batteries

©1955 Gould-National Batteries, Inc.

GOULD
Batteries

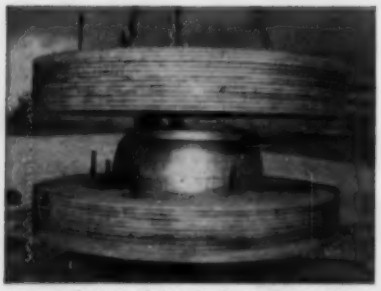
GOULD-NATIONAL BATTERIES, INC.
TRENTON 7, N. J.

"BETTER BATTERIES THROUGH RESEARCH"

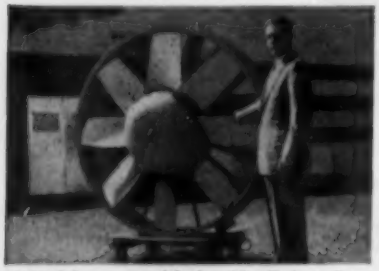
Always Use Gould-National Automobile and Truck Batteries

Before the blast—Welded Monel cylinder for Moore fan hub is lowered into heavily reinforced "dynamite die." It will be filled with water, and a dynamite stick suspended at water level.

Dynamite forms Monel Fan Hub



Formed Monel fan hub — When the "dynamite die" blows its top, the Monel cylinder is neatly forced into the contours of the die in a single operation. Crack-free, it comes out like this.



Monel fan assembled — Mr. Robert D. Moore, President of The Moore Company, points out long life features of fan made entirely from light-weight Monel sheet. Monel's strength and ease of fabrication eliminate heavy cast parts.

You usually think of dynamiting as a fast way to change the landscape.

But put dynamite in a well-reinforced die and you have a fast, *economical* way to shape metal... *if the metal can take it!*

That was the idea The Moore Company in Marceline, Mo., came up with to solve a design problem.

They wanted to offer customers big industrial fans especially designed for severely corrosive atmospheres. Monel's excellent corrosion resistance made it just the metal they needed to build such units. The question was, how could they fabricate fan parts from Monel sheet most economically, especially the big fan hubs.

Dynamiting was the ingenious answer for forming a welded Monel cylinder into a barrel-shaped fan hub. And dynamiting was the answer *only because Monel has the strength and ductility to take it!* The welds have, too.

With this simple shaping method, and other time and metal-saving fabrication methods, The Moore Company can now offer their customers corrosion-resisting all-Monel fans. Offer them *at a price only slightly higher than fans made of ordinary metals.*

When you need metals to meet destructive conditions

... think of Monel and the other easily fabricated Inco Nickel Alloys. Send for *Standard Alloys for Special Problems.* In this booklet you'll see actual examples of the wide range of practical applications for Inco Nickel Alloys. You'll find answers to many difficult metal problems.

The International Nickel Company, Inc.
67 Wall Street New York 5, N. Y.

INCO TRADE MARK **Nickel Alloys**

MONEL® • "R"® MONEL • "K"® MONEL "KR"® MONEL • "S"® MONEL • INCONEL® INCONEL "X"® • INCONEL "W"® • INCOLOY® NIMONIC® Alloys • NICKEL • LOW CARBON NICKEL • DURANICKEL®

Metalworking Outlook

A Guaranteed Wage Already

The United Auto Workers' hullabaloo about the guaranteed wage (p. 59) obscures the fact that we already have one. From the 1930s through 1954, American employers paid $19.7 billion to state unemployment compensation funds. Some $13.5 billion has been paid to unemployed persons through 1954. At present, $8.2 billion, including $2 billion in interest earnings, remains in reserve available for unemployment payments. Except for minor provisions in effect in two states, those guarantees are paid for entirely by employers. General Motors Corp. cites those figures in its annual report, a move interpreted by some as indicating it will strongly oppose GAW. But nowhere did GM make an outright statement against the plan, in marked contrast to General Electric Co. which has just said the CIO electrical workers are "barking up an empty tree" in calling for GAW.

Setting-Up Exercises

The UAW's muscle flexing against the auto industry continues. It takes the form of brief "unauthorized" walkouts to show management it means business when negotiations start on GAW. One of the latest was a walkout last week of about 8000 hourly employees at three Ford Motor Co. plants in Cleveland suburbs. It ended after 24 hours.

Mr. Patman Looks Around

Rep. Wright Patman's Small Business Committee and its subgroups will make these investigations this year: Whether federal agencies are effectively enforcing laws designed to protect small business; whether small business is getting a fair share of government procurement; whether military buying procedures might kill off small suppliers of aircraft parts; operations of small uranium mining companies; and supply conditions in natural rubber, copper and nickel.

The Heat's On

Business is warming up for makers of industrial heating equipment. December, 1954, orders were up 86 per cent from those of the same month in 1953. January, 1955, volume climbed 37 per cent over that of January, 1954. "One reason," says Carl L. Ipsen, executive vice president of Industrial Heating Equipment Association, "is that executives were alarmed by the international situation and decided to modernize before equipment might be hard to get."

Used Tool Sales Slide

Used machine tool sales are slipping, partly because of unfavorable treatment in the new tax laws. Volume dropped from $36.3 million in 1951

to $29.8 million in 1952, to $26 million in 1953, to $19.5 million last year. Prospects are for no further slippage in 1955, but the volume probably won't rise significantly either.

Steel Merger Plan Still Alive

Youngstown Sheet & Tube Co. and Bethlehem Steel Corp. are still studying the "best course of action" for a proposed merger. Sheet & Tube's president, J. L. Mauthe, revealed that in a letter to stockholders. Bethlehem's chairman, Eugene L. Grace, says the matter now is in the hands of counsel. Merger negotiations were begun last year, but the Justice department in September said it would not approve such a proposal because it would tend to lessen competition.

Report on Fuels

Look for long congressional and even court battles before much of the report by the President's fuels committee is implemented. The group recommended removal of all federal control over natural gas before it enters interstate pipelines, limits on imports of foreign oil and freight rate adjustments to help coal. It also proposed a subsidy for coal exports. Several of the recommendations will require congressional action, notably the gas proposal which counters a Supreme Court ruling of last June. Then, the court gave the Federal Power Commission authority to regulate the price of natural gas from wellhead to consumer.

Tax Break

Removal of the "double standard" of deductions has given a federal income tax break to thousands of salesmen and other employees for this year's tax return. Commerce Clearing House reports that new provisions allow all employees to deduct from gross income any qualified expenses incurred in the course of their work for which they are not reimbursed. They can still take advantage of the 10-per-cent standard deduction. Previously, such expenses could be listed along with other deductions on Form 1040.

Straws in the Wind

GM won't give a cost-of-living adjustment during the next three months because the index didn't change enough . . . Westinghouse Electric Corp. has had "a considerable increase in new orders for heavy electric power equipment in the first two months this year" . . . GE will build a $15-million plant to make home cooling units in Tyler, Tex. . . . W. Kenneth Davis, new director of the Atomic Energy Commission's Reactor Division, predicts that before 1960 U.S. private industry could complete the most advanced type of atomic power plant.

This Week in Metalworking

Capital spending could hit $48.1 billion by 1965 (p. 62) . . . The President's highway plan would require $3.5 billion worth of new construction equipment (p. 63) . . . European demand for steel booms (p. 70) . . . How suggestion systems can work for you (p. 71).

These 25 parts of Armco ALUMINIZED STEEL are used by one company in eight different appliances. They are electric toasters, irons, corn poppers, coffee makers, waffle irons, sandwich grills, deep-fat fryers and percolators. Parts include element pans, bottoms, baffles, handle and terminal brackets, crumb tray, shield and base plate.

Special Armco Steel CUTS COSTS OF 25 PARTS FOR MANUFACTURER

Here's what the manufacturer of electrical appliances gained by changing interior parts of eight products from plated metal to Armco ALUMINIZED STEEL:

LOWER COSTS

Elimination of plating ended handling, cleaning and racking costs as well as actual plating costs. This produced savings of as much as 10 cents a part.

BETTER PRODUCTS TOO

Efficiency of all appliances was improved noticeably. The high *heat-reflectivity* of Armco ALUMINIZED STEEL keeps heat inside where it belongs. This makes appliances easier on kilowatts, means lower table-top temperatures.

IMPROVED APPEARANCE

Many of these internal parts are partly visible. When made of plated steel they showed ugly discoloration from high temperatures. The Armco ALUMINIZED STEEL parts show no discoloration because of their fine *heat resistance*.

SEE FOR YOURSELF

If you make products or parts that require a combination of heat- and corrosion-resistance or heat reflectivity, investigate this hot-dip aluminum coated steel. It is made in sheets and coils 13-through 28-gage and in widths up to 48 inches depending on gage. For further information write us for the booklet, "Armco ALUMINIZED STEEL."

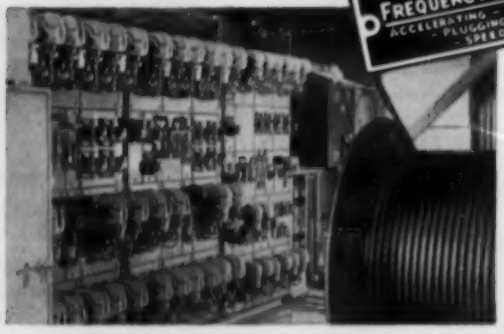
ARMCO STEEL CORPORATION
785 CURTIS STREET, MIDDLETOWN, OHIO

ARMCO

SHEFFIELD STEEL • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

Fast Lifts–Safe Lifts WITH EC&M CONTROL easy to operate, TOO

Narrow-width EC&M Cam Master Switches are closely grouped for operator's convenience on this 720 ton-per-hour Barge Unloader, designed, fabricated and erected by Heyl & Patterson for the Duquesne Slag Company, Pittsburgh, Pa.



EC&M LINE-ARC Contactor Controllers for Closing & Holding Line Motors and for the Trolley Motion are EC&M Frequency Relay Controlled for fast, safe operation.

Output increases and costs go down when operators find rhythmic response at their finger-tips. Paying out cable to dig into the pile, taking the swing out of a loaded bucket at the point of discharge, and keeping the bucket open when lowering for another load are time-savers on bulk material-handling applications.

On river unloading stations, at lake and ocean ports, EC&M Control has a reputation among operating management for fast handling because bucket manipulation, trolley travel and similar operations respond quickly to the operator's needs. Straight-line, lever-operated EC&M Cam Master Switches have a short throw in both directions—are less tiring on the operator—the off-point is distinct and easy to find when returning from any of the speed-points. Put your control applications up to EC&M.

It pays to specify **EC&M Control—control engineered for high output with safety.**

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Solution to Guaranteed Wage

The new labor contracts to be negotiated this spring between management and the automobile, electrical, railway shop and rubber worker unions will be unusually significant.

The principal issue is the guaranteed annual wage.

Since the war, there have been about 350 GAW plans in operation at one time or another. In manufacturing, the largest number has been in textiles, apparel, food and kindred products.

They vary considerably from those now proposed by the major unions.

For practical reasons, GAW plans now in force limit the amount of guaranteed employment, total compensation and those who are covered. Guarantees usually can be modified or withdrawn by management in case of financial extremity.

In contrast, the autoworkers, for example, ask for a complicated plan requiring definition of seniority status, contributions to a trust fund, ironclad rules on payment for layoff time, joint union-management administration and unpredictable costs.

This attempt to stabilize employment is a radical departure from the insurance and pension programs set up as part of management's recognition of the needs and welfare of employees.

Charges for insurance and pensions, unlike GAW, can be determined with actuarial certainty. The company knows where it stands financially.

The GAW scrambles the ideal with the practical. Management realizes that plants can be operated most efficiently when the labor force is employed full time every working day in the year. It wants layoffs and shut downs no more than shop workers do.

In driving for a GAW, labor really wants individual companies to supplement payments they already are obligated to make to unemployed workers under state programs.

If state unemployment plans are inadequate and outmoded, isn't it the joint responsibility of labor and management to see if they can be overhauled and made to function as originally intended?

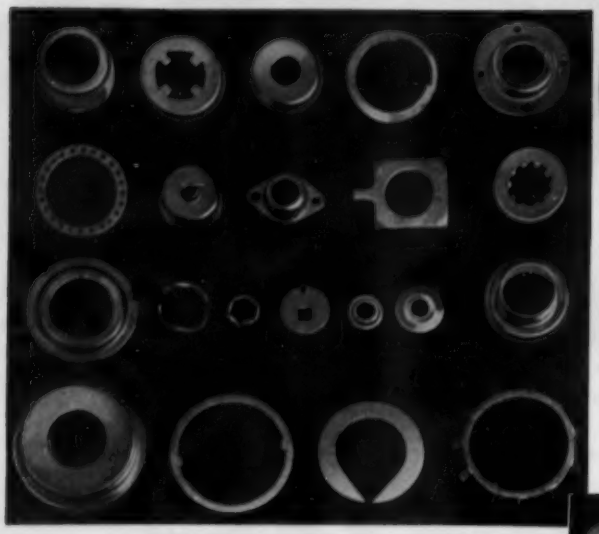
This would be another step in the direction of sociological progress under the free enterprise system. Labor would retain its right to work, management its right to manage.

Irwin H. Such
EDITOR

LEADERSHIP *Backed by*

68 Years of Continuous Service to American Industry

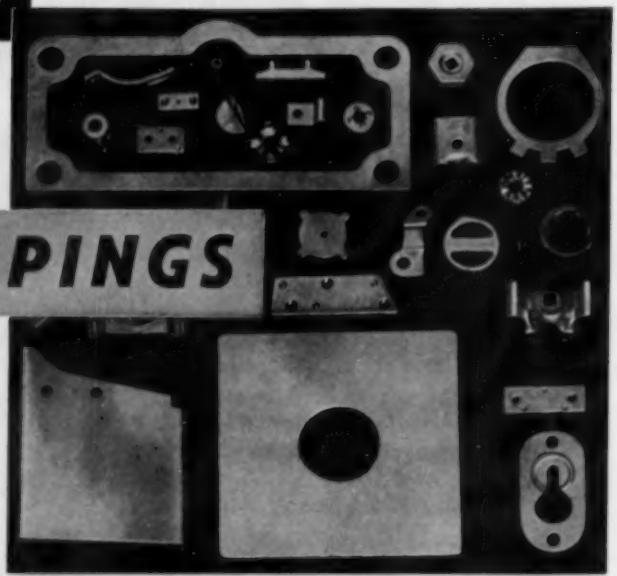
MILWAUKEE WROT WASHERS



SINCE 1887

In terms of "satisfaction to the customer" the dominant leadership of Wrought Washer Mfg. Company in this specialized field represents not only a thoroughly dependable source of supply to meet all your requirements for Standard and Special Washers, but of equal importance, it carries with it a wealth of technical know-how dealing with a wide variety of production and design problems . . . available to you as a gratis service. More than 25,000 sets of dies "in stock" at our plant offer the greatest range of selectivity.

Our equipment for handling contract production of stampings includes presses for blanking, forming, drawing, shearing and extruding. In many cases it is possible to produce stampings at a lower cost than they can be produced in your own plant, with our own equipment. Our own tool and die-making shop enables us to make up the necessary tools to fit your specifications.



STAMPINGS

We are equipped to furnish stampings in any desired materials and finishes, ranging in size from small parts to large heavy-gauge pieces. Our engineering staff will be glad to co-operate with you in every way consistent with economical and efficient production.

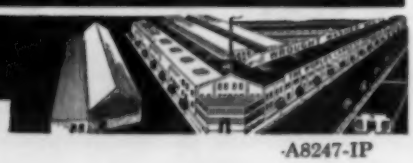
• • •

Send us your blueprints for quotations on special washers and stampings made to your individual specifications. Write for copy of 76-page Catalog "30" with tool list and complete round washer specifications.

WROUGHT WASHER MFG. CO.

THE WORLD'S LARGEST PRODUCER OF WASHERS

2103 SOUTH BAY STREET • MILWAUKEE 7, WISCONSIN



A8247-IP

NEA

In the balance: Pay security or dynamic growth . . .

What Price Annual Wage?

THE BELL will sound for the battle of the wage immediately following the UAW-CIO's "constitutional convention" which convenes in Cleveland on Mar. 27. Negotiations with General Motors and Ford, their contracts expire May 29 and June 1, will begin the week following.

Heading the list of items is the guaranteed annual wage (GAW), called the guaranteed employment plan (GEP) on alternate days by union spokesmen. Probably included in the demand package will also be a pension request, costing about 6 cents, insurance coverage costing about 6 cents, a direct raise demand of perhaps 12 cents and GAW demands costing about 20 or 25 cents. That means a package of close to 50 cents an hour, a first class headache for management.

Preliminaries Now — Specific "whereases" of the demands will not be revealed until negotiators are seated at the bargaining table. Meetings like that in Cleveland are to instill the righteousness of the cause in delegates and sound out sentiment.

But while labor has been flexing its muscles in public, management has yet to take off its bathrobe.

Why So Quiet? — Company silence apparently has been intended to obviate the need for labor statements which might put labor's position in an embarrassing light and inhibit bargaining flexibility. Although Mr. Reuther has engaged in some nimble footwork, the general framework of the GAW has been spelled out (see pp. 60-61). Omitted however, are key items such as the percentage of the annual wage to be guaranteed.

Nonetheless, management may have quite a time convincing the public that it shouldn't grant its workers security for "themselves and their children." Economic terms like increased fixed overhead, capital expansion and fluctuations in demand don't pack the human punch of food and security.

Here are some arguments due for more noising:

Better Planning—*Union spokesmen maintain that management should plan better to stabilize employment and cite such examples as the auto industry's rate of production, which they claim will turn out 72 per cent of the year's total by June.*

The answer to that one is the year's total would not be where it is if seasonal fluctuations in demand were not catered to by the automakers. People want cars when they want them, or else they decide to make the old one do another year. Further, stabilized employment is the goal of every firm. Such techniques as product diversification, intensified sales promotion and off-season price reductions are only a few of the techniques tried.

The reason: Management already has a great deal to gain from stabilized employment, including lower overhead, lower unemployment tax, less overtime, lower inventory, smoother capital planning, planned sales goals, improved employee relations and a more stable economy. Adding a GAW would only increase the penalties, not the incentives.

Yearly Salary—*Union spokesmen also argue that management is paid a yearly salary. Therefore,*

What Mr. Reuther Means by "Guaranteed Annual Wage"

THE GUARANTEE:

Workers with two years of seniority will be paid enough to maintain their "normal living standards" during any full-week layoff. These payments may go on for 52 consecutive weeks. Workers without full seniority will be similarly protected for a shorter period. All workers will be guaranteed 40 hours of pay at straight-time rates for part-week layoffs.

LIABILITY:

Employers can require laid off workers to register with state employment bureaus for other work. Standards of "suitable" work will be specified in the contracts. If the new job does not pay the worker's previous rate, the former employer must make up the difference. Employers' payments for full unemployment will be reduced by existing state compensation. (Established wage $100, unemployment compensation $30, GAW payment $70.)

FINANCING:

Employers will pay on a pay-as-you-go basis, with a trust fund backing. The trust fund will be established by the employer within a specified time by payments of a fixed percentage of his base payroll.

Although the trust fund is to be established by contract at a fixed amount, it can be varied later in either direction to adjust to changes in base payroll, rate of state unemployment compensation and other variables. It will be regulated by a joint union-employer board.

A further reinsurance pool, to be paid for out of trust fund surplus, will be set up to guarantee the plan against large-scale unemployment. It is not specified whether this reinsurance pool is to be privately or government-held. The employer can also make additional contributions to the trust fund reserve to anticipate unusually heavy layoffs.

ADMINISTRATION:

Plan will be administered by a board composed of equal numbers of union and employer representatives with an impartial chairman. Functions of the board will include deciding the eligibility of any worker for GAW payments together with their amount and duration. It will also supervise the trust fund and decide what constitutes "suitable" alternative work. Its decisions will be independent and will not be bound by state unemployment compensation laws.

workers should have a guaranteed annual wage.

Management's annual salary is not a guaranteed annual wage. Two-week notice can end the income of most management men no matter whether their salary is expressed as a weekly, monthly or yearly figure.

Depreciation Reserve — *Union spokesmen argue that a fund for the guaranteed annual wage would be no different from a fund for depreciation reserve.*

The reply to this one is that depreciation of equipment is a calculable thing based on the predicted useful life of the machines. The GAW, by contrast, would be subject to economic fluctuations and utterly unpredictable. Carrying a fund to guarantee wages for any number of employees approaching 100 per cent would cause liquidation of most firms' assets. One firm with a GAW plan estimates it would be completely liquidated in ten months of GAW payments. Anything else put into such a fund still would tie up money that properly should be put into capital expansion.

States Would Help — *Union spokesmen have also argued that the fund could be integrated with unemployment compensation payments to reduce the burden of companies under a GAW plan.*

This argument ignores the fact that anything paid for must be paid for by someone. Most UC laws provide a historical performance criterion of determining payment levels for employers which would merely divert the cost. In addition, companies not under a GAW would be in the position of having to resist pressure from companies that were for higher UC payments to reduce their GAW stake.

More serious, however, is the fact that rulings from many states undoubtedly would consider GAW payments as income. The technical problem rules out such integration now, though suitable rulings could change that. More important: How do you maintain the worker's incentive to work when he can make as much money by not working? The thing that has made UC work, argue its proponents, is the fact that payments have been kept down to 30 per

cent or so of normal pay. That leaves an incentive to return to work if suitable employment is found.

Defining "suitable employment" is also going to be a beauty under the GAW. The UAW agrees workers should be available for suitable employment, but argues the definition should be spelled out in the GAW plan rather than in the law of the state making the payments. How the UAW proposes to negotiate with the legislatures has not been clarified.

Good Psychology—*Union spokesmen come closest to reason in their arguments when they say that a GAW plan would provide workers with a good psychological climate and the wherewithal to buy.*

This is perhaps the toughest argument to answer because on the surface it sounds like good economics. "It takes money and confidence to keep the output of the factories in demand," say the union boys, "and the GAW will help the entire economy."

The problem is that people do not spend all their income for current consumption. From 15 to 20 per cent of the national income during prosperous periods goes into investment or what economists call producers' capital formation. This rate of capital formation largely spells the difference between depression and prosperity, and investment in consumer durable goods and nonessentials or luxuries experiences similar fluctuations.

In other words, economists have noted that business depressions sometimes come when consumer income is high, while recovery from depression and mass unemployment take place when consumer income hits new lows. These facts alone throw doubt on the "jobs make payrolls, payrolls make markets and markets make jobs" reasoning.

Management Side—Management, on the other hand, has heard a few arguments advanced for its side in the case. It is argued that guarantees would put a virtually impossible load on enterprise and markedly curtail incentive to expand. For the big cost of production is labor.

To this the unions reply that companies now gamble capital and equipment on new enterprises and can gamble employment guarantees as well.

Competitive Angle — The management side points out that GAW obligations held by one company not held by others would saddle the GAW-paying firm with an unfair burden in competition, create the need for intercompany planning or cartelization.

The union answers are simply that if management does its job well and stabilizes employment (which the union does not tell how to accomplish), the payments will be negligible and no firm will be handicapped nor will the need for cartelization arise.

A Starter—Basic issues around which negotiations will proceed include such questions as which workers in the plant will be covered, to what extent will they be covered and how long will they be covered. It is immediately apparent that a relatively harmless initial "guaranteed annual wage" could be drawn up still within the UAW-CIO announced framework on this basis.

Management will have a few demands of its own to present at the bargaining table. It will insist on some sort of limit on its liability above and beyond the limits contained in the extent of the coverage itself. Some sort of fund arrangement similar to the pension fund setup may be the answer the union will be forced to accept.

Incentives—In addition, management will undoubtedly insist upon a plan which contains sound incentives for workers to return to work rather than remain unemployed. More important, the forgotten productivity factors should come back into the limelight, and workers will be expected to bear a strong part of cutting labor costs in the end product. Sound incentive systems should be insisted upon by management to insure that its labor bill, and hence its obligation, is as low as possible.

Management's right to manage will be stressed as much as the workers' right to work. The ability to shift workers to jobs within the plant when their services are not required on their regular job must be implemented. Bumping and downgrading promise to be two of the really big issues in the negotiations, as well as enforcement of the "availability for work" clause. "Suitable employment" is another alleviator of the burden on management and will be broadened as much as possible.

Evidence — Although the exact settlement will depend on a compromise of the now-secret demands of union and management representatives, there is evidence of the nature of the settlement.

First, there will be a settlement, probably without a strike. Mr. Reuther will get something he can call a guaranteed annual wage, guaranteed employment plan or anything else he may dream up to name it in the interim. That's because of the fundamental situation in the auto industry which revolves around the competitive circumstances between Ford and Chevrolet. Neither can afford a prolonged strike as well as a carefully defined increase in overhead, despite the wedge for future negotiations established. Willingness of both to invest in capacity which entails an overhead penalty indicates the reasoning involved.

Pressure on Ford — Although both will be negotiating simultaneously, Ford will probably be under UAW pressure to settle first. The reason: Negotiators can be sure General Motors will match or better the Ford offering, so a victory at Ford insures victory at GM. That, in turn, will throw the onus on Chrysler and the Little Three to ante up or get out of the game. In itself, this could be enough to entail a merger for survival into a fourth major producer. Overhead has been the impetus to merger before.

Details of the demands probably will include guarantee of 52-week pay at the rate of 40 hours a week for some high seniority workers. Mr. Reuther has framed this in his general demand, but not all workers will be so covered. The level of seniority is anybody's guess but will be based on carefully calculated automaker statistics. Workers with less seniority will get less of a guarantee either in number of weeks or hours.

Bitter Issue—The more bitter bone of contention could be the 40-hour call-in guarantee. Mr. Reuther has committed himself on

this for all workers, must make some concession to achieve it. Productivity and incentives will be management's bargaining demands that could contain the solution to some long-standing automaker problems with labor. One important point: The call-in demand is simply an enlargement of call-in pay, but only people with seniority would be covered for full-week layoffs.

A must in settlements would be a formula for diminishing obligations of the employer as the workforce declines to protect the company against insolvency. Auto negotiators, no slouches in the cost department, will carefully calculate protective devices probably never to be understood by the union rank and file.

Precedent — Mr. Reuther, it seems clear, will achieve something he can call a guaranteed annual wage in 1955. Impact on steel firms, electrical firms and the railroads already prominently mentioned in GAW target talk will be an independent problem. The precedent set in the auto industry will not necessarily be more than a point of departure for other industries.

But the wedge will have been started. Merged AFL-CIO forces imply for the moment only a joining together on the road both were already traveling independently. For the future the story could be different.

Rigid Future—Widening of the wedge started this year could bring the need for increased government participation in GAW support and in turn the need for a controlled economy. Unwillingness of management to invest and the tie-up of available capital for expansion could bring something approaching economic stagnation and socialistic remedial action.

No matter how you cut it, the events about to transpire in 1955 promise that in the future good management must be even better to survive. While we may get some kind of GAW, we will probably never get any kind of GAP (guaranteed annual profit).

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department,* STEEL, *Penton Building, Cleveland 13, Ohio*

Capital Goods: Trend Is Up

Analysis of the next ten years reveals that consistent gains will be made by the capital goods industry. Calculations are based on stock growth rate

THE CAPITAL GOODS market will increase steadily the next ten years, reaching a climax of $48.1 billion by 1965, predicts the Machinery & Allied Products Institute.

Calculations are based on the projection of stock growth rates to 1965. The take-off point is the estimated present gross of plant and equipment stocks at 1953 prices.

Background—The growth rate for plant stock during the postwar era has hovered near 2 per cent per annum. Equipment stock, for the same period, started off with an extremely high growth rate, approaching 10 per cent during the peak year of 1947. From 1947 it declined (except for 1950) to the current level which is slightly under 4.5 per cent. Growth rates, before the depression, were about 3 per cent per annum for plant and equipment stock.

Considerations — Capital goods stock usually grows with the nation's over-all economy which has been about 4.5 per cent in recent years. Taking the predepression figure of 3 per cent into consideration, MAPI has selected a theoretical mean, establishing 3 per cent per annum for plant expansion projection and 4 per cent per annum for equipment stock (see chart).

Actually, these percentages may be quite conservative because of new obsolescence factors. The tremendous growth of research and development is introducing accelerated obsolescence for products and processes. It could well be that year-by-year requirements will exceed those projected by MAPI.

Navy Reviews Machine Tools

A critical review of machine tools valued at $150 million is being conducted by the Navy Bureau of Ships. Results will help in the organization of an orderly replacement program.

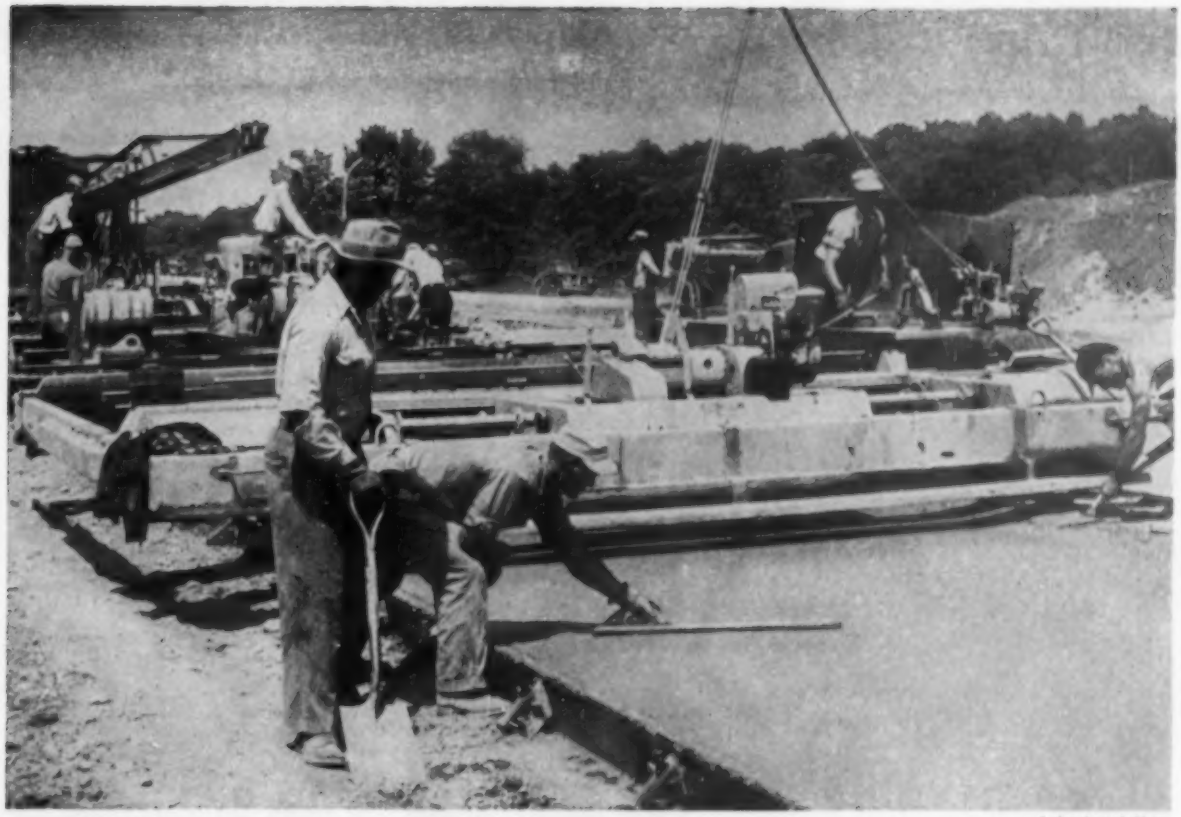
Such factors as obsolescence, productive capacity, product quality, maintenance costs, floor space, power and disposal values will be taken into consideration by the bureau.

TEN YEAR CAPITAL GOODS PROJECTION

(Billions of Dollars at 1953 Prices)

	PLANT		EQUIPMENT		GRAND TOTAL
	Expansion	Replacement	Expansion	Replacement	
1955	5.44	4.14	11.15	10.37	31.10
1956	6.01	4.20	11.36	11.18	32.75
1957	6.70	4.26	11.64	12.09	34.69
1958	7.43	4.32	11.90	12.68	36.33
1959	8.20	4.38	12.16	13.39	38.13
1960	9.04	4.46	12.40	14.09	39.99
1961	9.31	4.52	12.90	14.80	41.53
1962	9.59	4.59	13.42	15.53	43.13
1963	9.88	4.67	13.95	16.25	44.75
1964	10.17	4.75	14.51	16.97	46.40
1965	10.48	4.84	15.09	17.69	48.10

Source: Machinery & Allied Products Institute



Authenticated News

We're headed for a highway construction boom; here's . . .

Industry's Stake in Road Plans

IF CONGRESS comes through on President Eisenhower's $101-billion highway expansion program, the next ten years will see king-size expansions in finished steel and construction machinery markets.

Since every $1 million spent on highways requires from 420 to 450 tons of finished steel, the complete program will call for roughly 45 million tons, or about two-thirds of last year's output. Over the ten-year period, average annual consumption will have to be boosted by three times the 1.5 million tons used in 1954.

Big Picture—But more than finished steel goes into road building. An estimated $3.5 billion in new construction machinery will also be needed before the ten years are up. This excludes replacement requirements, now figured at about $1 billion a year for all U. S. contractors. Replacement costs must also go up as more machines come into service.

A survey by the American Road Builders' Association shows that, including replacements, better than 1.2-million new units of equipment will be needed to maintain the program. The breakdown indicates that 91,000 crawler tractors, 45,100 scrapers and 63,900 pieces of off-highway hauling machinery will be just a few of the metal-working products required.

Details—The 88-mile West Virginia turnpike took 2000 pieces of construction equipment, including crawler tractors, scrapers, graders, drills, air compressors, rollers and wagons. Their replacement value was more than $30 million. The President's plan calls for 40,000 miles of interstate highway.

Impact of the program is emphasized by other ARBA findings, which indicate that several types of equipment might well be in short supply if expansion is carried through along the lines it suggests. Its outline calls for spending $6 billion the first year of the program, $8 billion the second, $10 billion the third and $11 billion for each remaining year—to total $101 billion for the ten years. Possible shortages, especially during the second and third years of expansion, are foreseen in wheel tractors, off-highway hauling equipment, concrete pavers, spreaders, finishers and screening and crushing plants.

No Question—Although there's some doubt about just how much Congress will buy, nobody's arguing the need. Many other proposals are on the floor, and in one form or another, extensive highway building is a certainty.

The situation is healthy. Highway transportation accounts for one-eighth of the gross national product. Any extensive program will be an important bolster for our peacetime economy.

New three-piece rim paves way as . . .

Tubeless Truck Tires Roll

DEVELOPMENT OF an airtight rim is giving the Goodyear Tire & Rubber Co. an opportunity to introduce tubeless tires to the trucking industry.

History—On conventional large trucks, tires are mounted on flat base rims having some form of removable side flange which cannot be made airtight. "The basic problem," said Mr. H. J. Lafaye, general manager of Goodyear's Metal Products Division, "was to find a way to put a truck tire and rim into the space formerly occupied by the tire itself. If the tire was made smaller on the inside, it would interfere with the brake drum; and if it was made any larger on the outside, it would conflict with vehicular clearances."

Goodyear's Answer—The solution was the development of a new, three-piece rim with a small rubber ring (O-ring) which locks in the air—the three pieces becoming one airtight unit when installed. The sealing ring or O-ring locks in the air because it is compressed between the rim's base and the side ring.

Small trucks present no problem since tubeless tires can be mounted on existing drop center rims. The top range for best tubeless truck tire performance with a drop center rim is apparently reached at the 10.00-20 size.

Highlights — Advantages beside the tubeless feature include: 1. It permits universal application to all sizes and all types of truck tires. This includes all types of "high load" constructions. 2. Tire mounting is simplified. The valve is fastened in the rim and tubes and flaps are eliminated. 3. Standard dimensions of height and width are used for conventional truck tires.

The Tru-Seal tire for the airtight rim is the same in design as conventional truck tires, except for the tubeless feature and a slight alteration in the bead base shape.

With some modification, the new rim and tire assembly is being tested on earth-moving equipment.

Ride Closer to the Rails

Pennsylvania railroad passengers will ride closer to the rails.

Pennsy directors have authorized construction of a train of new passenger coaches that feature a low center of gravity—"the lowest of any yet engineered," says James M. Symes, Pennsylvania's president.

Entirely new design of the coaches combines the low center of weight with strong tubular construction. The initial seven-car train will include a separate power car for air conditioning, heating and lighting equipment. The train will accommodate nearly 600 passengers and cost $1 million.

GE: Value Analysis Program

Value analysis is being taught to representatives for various components of General Electric Co.'s Major Appliance Division. In addition to GE personnel, outside vendors also have displays and participate in the seminars. Speakers at the first seminar, which was held for three weeks during February, included Charles K. Rieger, vice-president and general manager of the Major Appliance Division.

Upcoming value analysis programs: March and April, Lynn, Mass.; April, Syracuse, N. Y.; and a company-wide seminar in May, Schenectady, N. Y. Each program is similar. Related subjects are presented by various speakers; and participants are divided into workshop groups, which analyze products and develop suggested ideas for cutting costs.

Weeks Backs Associations

Secretary of commerce wants fullest co-operation of government and industry

SINCLAIR WEEKS, secretary of commerce, wants trade association officials to continue to sit in on Industry Advisory Committee meetings.

Disregarding traditional Justice department opposition, he remarks: "The Department of Commerce places a high value on its close ties with trade associations, and I am glad to report that trade association executives have made a splendid contribution to the 40-odd industry conferences held in the last two years."

For the Record — Mr. Week's statement of policy was set forth in a letter to Robert H. Shields, chairman of the Government Relations Committee, American Trade Association Executives.

"As you well know," he pointed out, "we have been trying to develop policies and procedures which would enable us to obtain the views and recommendations of American business, so that we may constantly increase the effectiveness of our services to business, to the public and to the various agencies of government and Congress."

Adding that his invitation was also extended to company executives, Mr. Weeks said: "At all industry meetings within this department where attendance is by invitation, both industry and trade executives will be eligible for participation when they have knowledge of the subject and their attendance is appropriate."

Monopoly? — Judge Stanley Barnes, assistant attorney general and head of the government's antitrust division, said that the Department of Commerce's decision was reached without the Justice department's approval. The Department of Justice has always opposed admitting trade association executives to government-industry conferences on the ground that such participation might promote monopoly. Although he has not ordered a specific investigation, Judge Barnes remarked that the Justice department was "concerned," and said: "We are certainly not going to close our eyes to something that occurs there."

Otis To Stay in Yonkers

Otis Elevator Co. will remain in Yonkers, N. Y. L. A. Peterson, president, stated to employees on Jan. 15: "Help reduce costs or we'll move." Immediately after this speech, Walter Thompson, president of Local 453 of the CIO's IUE, and David A. Roberts, personnel manager of the Yonkers Plant, started drafting a plan which has since been approved by all of the company's employees in a 3-to-1 vote.

The agreement includes: 1. There will be no reduction in pay rates, salaries, pensions or welfare benefits. The company incentive system is to be kept in effect. 2. Co-operative program for reducing costs is being inaugurated. Emphasis will be placed on the conservation of tools, supplies, equipment and the reduction of nonproductive practices. 3. A joint effort will be made to reduce accidents by using more protective equipment. 4. The company will make a substantial investment in the improvement and modernization of the Yonkers plant if the co-operative program is effective.

Marking Makes Headway

Continuous marking of steel products is reported to be making progress

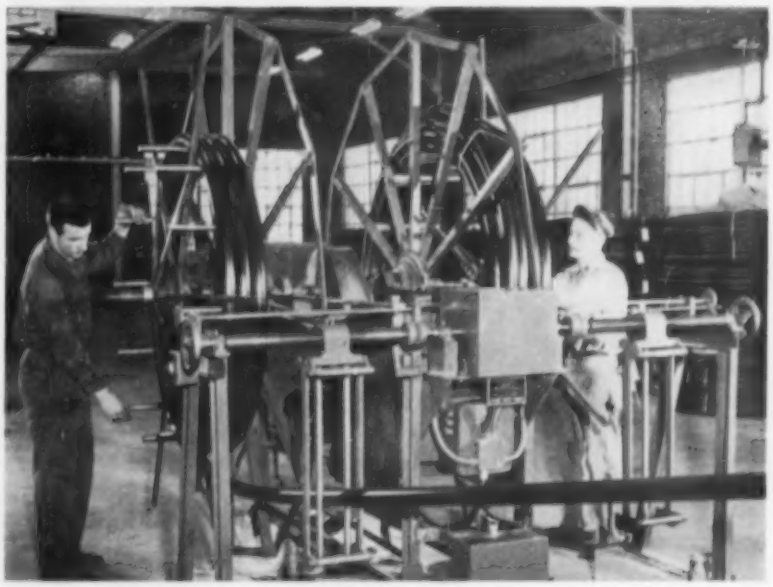
OFFSET PRINTING is among the latest methods being tried to continuously mark steel products.

Following a meeting in Washington of government and industry officials, several steel companies will try out the new method this month. Others being tested by steel companies include transparent tape.

Part of the Plan—It's all part of a long-range plan to provide for continuous and durable marking of selected steel products. The program to test such methods is being co-ordinated by Business & Defense Services Administration's Iron & Steel Division.

Members of that division met recently with representatives of the steel industry and the American Iron & Steel Institute. Also at the meetings were officials of the Defense department and the Atomic Energy Commission.

Previous Gain—Some steel companies said they are testing continuous hot impression markings for tubular steel products. Others expect to follow this start.



U. S. Steel "Winds Up" Orders

Special "ferris wheel" coilers handle orders of plastic pipe being produced at the Gary, Ind., plant of U. S. Steel Corp.'s National Tube Division. Construction of the Gary plastic pipe plant began in June, 1954, and production has been under way since October, 1954. The first shipment consisted of 2 and 3-in. pipe-

By E. C. KREUTZBERG Washington Editor

NEA

T-H's coauthor Fred Hartley returns to labor front in . . .

War Against Compulsory Unionism

"LABOR UNIONS hold in their membership hundreds of thousands of American citizens against their will," says Fred A. Hartley Jr., president of the newly formed National Right to Work Committee (NRWC).

Mr. Hartley, former congressman and co-author of the Taft-Hartley Act, states that the primary objective of the NRWC is to prevent deletion of section 14(b) of the T-H Act which recognizes the prerogative of states to pass right-to-work laws to protect workers against compulsory unionism.

Future Steps—Merging the AFL and CIO may bring a drive to unionize all workers. The unions could also try to overthrow the laws of 17 states which now give workers the right to work without belonging to a union.

Tremendous interest has greeted the formation of the NRWC which has its headquarters in the Ring Bldg., 1001 15th St. N.W., Washington, D. C. Letters are pouring in from workers who have lost their jobs because they failed to join a union. Correspondence also is being received from workers who have been forced to join a union to keep their jobs.

Facts Needed—The appeal of the NRWC is particularly potent because of the widespread feeling that lawmakers need more evidence of popular support before they will vote against "big labor" demands.

Mr. Hartley told STEEL: "This committee is not antiunion and will not concern itself with any labor matters except those which involve compulsion of the individual worker. Union leaders have no vested right to drive from their means of livelihood those individuals who will not bow to them."

One Way Law—"We have a one-sided group of laws which protects the individual's right to join a union while no provision is made to protect the worker who does not want to join a union. We must correct this situation. We must realize that the argument for compulsory unionism is an argument that a minority group should not be allowed to exist in this country. Reasoning of this sort has resulted in the surrender of individual liberties."

Future—The committee is working with organizations in states having right-to-work laws. Legislators in state capitals and in Washington are impressed with the fact that the right-to-work laws already have powerful backing among the electorate. It is anticipated that every state in the U. S. will soon have a right-to-work organization patterned after the NRWC.

Changes: Antitrust Laws . . .

Two resolutions dealing with the violation of antitrust laws have been given favorable consideration by the House Judiciary Committee. House Resolution 3659 would increase fines for antitrust violations from $5000 to $50,000, while H. R. 3658 would permit the federal government, for the first time, to recover damages in suits involving the violation of antitrust laws.

A Straight Shot of 925 FEET

At the NEW
FAIRLESS WORKS
of the United States Steel Corporation

A MORGAN
Horizontal-Vertical Continuous Rolling Mill reduces billets to merchant bar sections "straightaway" for 925 feet from furnace to cooling bed

MORGAN CONSTRUCTION COMPANY
WORCESTER, MASSACHUSETTS RM-89

Rolling Mills - Morgoil Bearings - Wire Mills
Regenerative Furnace Control - Ejectors - Gas Producers

English Representative
International Construction Co., 56 Kingsway, London, W. C. 2, England

BUILDS EXTRA SELLING POWER INTO YOUR PRODUCTS

HOT
. . . rolled strip steel . . .
COLD

TO ORDER

Made and delivered as specified —ready to meet your toughest demands— hallmarks of ALAN WOOD strip steel.

Produced by modern, up-to-date, continuous mills under the most rigid metallurgical control, ALAN WOOD strip possesses the "custom-produced" requirements of a superior product . . . qualities that build extra selling power and repeat sales into your products.

If you require hot or cold rolled sheet or strip steel . . . choose a specialist who understands your production problems . . . and delivers according to your specifications.

IRON PRODUCTS
"Swede" *pig iron*
STEEL PRODUCTS
Plates (sheared)
Hot rolled sheets
Hot rolled strip
Cold rolled sheets
Cold rolled strip
ROLLED STEEL FLOOR PLATE
A.W. ALGRIP *abrasive*
A.W. SUPER-DIAMOND *pattern*
A.W. CUT NAILS
MINE PRODUCTS
COKE
COAL CHEMICALS

ALAN WOOD STEEL COMPANY

steelmasters for 129 years • CONSHOHOCKEN, PENNA.

DISTRICT OFFICES AND REPRESENTATIVES: Philadelphia • New York • Houston Los Angeles • Atlanta • Boston • Buffalo • Cincinnati • Cleveland • Detroit • Pittsburgh Richmond • St. Paul • San Francisco • Seattle • Montreal and Toronto— A. C. Leslie & Co., Limited

SM-39

Chuck Sutherland: 'Team Design Pays Off'

"DESIGN by task force—that's one answer to the problem of creating products we can make that will do the best over-all job for our customers."

That's the way C. R. Sutherland describes his concept of the engineer in management. Assistant chief engineer at Reliance Electric & Engineering Co., Cleveland, he's a young 45. He's been with the company for 15 years, and in his climb up the ladder, he has been machine designer, plant engineer, chief mechanical engineer for development and divisional manager of engineering.

The Payoff—One Reliance task force has one man each from sales, purchasing, manufacturing and engineering. It meets anytime there's a problem. "The payoff," says Chuck Sutherland, "is in co-ordinating all four groups before design is fixed.

"At Reliance we get a lot of special-purpose jobs, and perhaps our biggest design consideration is to make these special products adaptable later for other jobs. That way, instead of saddling the design bill on a single customer, we can spread it around like insurance."

Working Group—In the first approaches to group design at Reliance in 1946, the system was set up on a committee basis. "But," Mr. Sutherland points out, "we soon found that committee action just didn't make for a working tool.

"The task force is much better. With four people, we still get the all-important 'premix' of thought, but we have a working group and can move right into our basic job of planning designs that will be practical."

For 1955, his own set of objectives include ways to secure product cost reduction through better co-operation between manufacturing and design and the correlation of Reliance's complicated motor engineering data as an aid to sales efficiency—the company makes more than 250 sizes of armature for one customer alone.

Ideas—"I've never had what I'd call an earth-shaking idea," he says, "but we've been able to put an awful lot of small ideas together and make them work. Ideas are the bricks that progress is built from. One of the most important jobs of any management team is to foster ideas, formalize them and make sure that they are put to work."

Quick survey of foreign steel producers reveals . . .

Widespread Demand Spurs Output

STEELMAKING in Europe continues to feed well on a diversified menu of new orders.

British mills operated at an annual rate of 21,767,900 net tons in January, 1955, but it wasn't enough to keep up with demand. State-owned British railroads have launched a substantial development program. The automotive industry is shooting for new records after a top output of over 1 million cars and trucks in 1954. British shipyards are booked solid through 1955.

Continent — German iron and steel mills have six to ten-month backlogs, many producers refusing to accept more orders. Capital goods manufacturers are especially strong buyers in the steel market. There is also opinion that a considerable portion of current steel deliveries is going to refill supply pipelines.

French mills produced 1,412,400 net tons of steel in January, 1955, compared with 1,399,200 net tons in December, and 1,336,500 net tons in November, 1954. January output was the best since January, 1949.

Over the Top—Belgian and Luxemburg steelmakers had a banner year in 1954, with an output slightly exceeding the 1951 record volume of 5.5 million net tons. January, 1955, steel production of these two countries continued the upward trend—801,900 net tons, compared with 799,700 net tons in December, 1954. Machine tool industry steel orders are not particularly strong in Belgium, but electrical machinery, small arms and ammunition needs are bulging. Export orders are also up.

With new orders coming in from such a variety of strong markets, output in 1955 will suffer less from lack of orders than from labor unrest, such as the strike of some 60,000 workers in 80 Saarland iron and steel plants which began last month.

Expansion in Latin America

The Brazilian steel industry is still growing.

Volta Redonda, largest Brazilian steel mill, raised its yearly production rate to 720,000 tons at the beginning of 1954 and is aiming at 1 million tons in the near future. Belgo Mineira, second largest Brazilian steel plant, increased its output from 190,000 tons in 1953 to 250,000 tons in 1954.

Mannesmann Co., which recently started operations in Belo Horizonte, is producing seamless steel tubing at an annual rate of 100,000 tons; the Acesita Co., near Rio Doce, has reached a yearly rate of 125,000 tons.

Two new steel plants, in Lafaiete, Minas Gerais, and Vitoria, Espirito Santo, are being built and will begin production soon.

Prices Point Upward

Another sure sign of the firming steel market in Europe is prices. The Belgian Entente a l'Exportation shows the following price trend on steel sold to the export market—outside the European Coal & Steel Community: Ingots, $61.75 — $66.75 — $70.75 in September, November and December, 1954 (prices quoted in U.S. dollars per metric ton). For heavy and medium plates, $92-$98—$98—$109 over the same period; wire rod, $91—$94—$96; and ship plates, $108—$108—$114.

How Important Are U.S. Exports?

Percentages of the Gross National Product for Selected Years	1929	1937	1950	1953	1954*
Merchandise Exports					
Including military aid	—	—	3.6	4.3	4.2
Excluding military aid	5.0	3.6	3.5	3.4	3.5
Total Exports of Goods & Services					
Including military aid	—	—	5.1	5.8	5.7
Excluding military aid	6.7	5.1	4.9	4.7	4.9
Residential Nonfarm Construction	3.4	2.1	4.4	3.3	3.8
Business Purchases of Capital Equipment	5.7	5.6	7.4	6.7	6.2
Federal Purchases for National Security	1.2	5.1	6.5	14.3	12.2
Federal Purchases Other Than for National Security			1.4	2.3	1.9
Consumer Purchases of Durable Goods	8.8	7.6	10.0	8.1	8.1
Cash Receipts from Farming	10.8	10.1	10.0	8.6	8.5

*Estimated.
Source: International Economic Analysis Division, Bureau of Foreign Commerce.

Ideas saved Crucible $65,894 in 1954. Here's how to . . .

Make Suggestions Work for You

FROM "DROP DEAD" to "here's a way to save money."

That's how suggestion systems have evolved since World War II. Once a place where employees dropped prankster notes to the boss, the suggestion box today is a multimillion business.

It's Big—Last year General Motors' employees packed 192,000 ideas into suggestion boxes. Nearly 47,000 were worth adopting. GM paid awards to the tune of nearly $2.4 million.

To be effective, suggestion system programs must be well thought out. Here are some guideposts given by the National Association of Suggestion Systems, Chicago:

Administration — Some companies like GM, Allis-Chalmers Mfg. Co. and Timken Roller Bearing Co. have separate departments in charge of suggestion systems. Others delegate the problem to personnel, industrial relations or engineering. Suggestions are checked either by full-time investigators or by committee. Awards are nearly always determined by committee, with final decisions resting with top management.

Awards—The key factor is to pay an award commensurate with the value of the suggestion. The majority of metalworkers are paying 10 to 20 per cent of the first year's net savings created by the suggestion. Westinghouse Electric Corp., which recently made a $4375 award to an employee for a purchasing policy suggestion, has a top limit of $15,000.

Eligibility—Most companies include only hourly employees. Cost-cutting suggestions are regarded as part of the job for foremen, supervisors and other management men. Exceptions: Some companies make awards to supervisors and technical people when their suggestions are foreign to their normal duties.

Will you get enough good suggestions from a formal program to pay off? Records of the NASS for 1953 show that the machinery and equipment industry (excepting electrical) averaged 419 suggestions per 1000 employees, with 32 per cent of them adopted. The electrical machinery and equipment industry averaged 479 suggestions and adopted 24.6 per cent. Ferrous and nonferrous metals and products groups averaged 227 suggestions, with 28.2 per cent adopted.

What Do You Want? — What types of suggestions can you expect? Crucible Steel Co. of America finds that 33 per cent of its adopted suggestions cover safety and health. About 23 per cent are on saving time and increasing production; 10 per cent are for reducing damage; 10 per cent for reducing delay; 24 per cent for miscellaneous ideas. Crucible has saved almost $400,000 since inception of its plan seven years ago.

"Continual promotion is one of the most important factors in the success of suggestion systems," says C. W. Hooper, co-ordinator of Stewart-Warner Corp.'s program. At two of the firm's plants last year, suggestions saved more than $16 per employee.

Sales Job—In addition to monetary awards, factors to stress in your promotion are recognition of the employee's creative ability, the opportunity to improve the individual's work and the opportunity to produce a better product at less cost than the competition.

One point of caution . . . be sure you're set to handle promptly all suggestions. "There's nothing that'll sour employees on suggestion programs faster than to have their brain child gather dust for months in someone's office waiting for investigation," Mr Hooper emphasizes.

HOW HYATTS CAN HELP YOU...

INCREASE STEEL PRODUCTION:

Maximum utilization of equipment **is more important than ever these days—if you want to meet the demand for more production and *still keep your costs in line.* A single roller bearing failure that shuts down one machine can cripple a vital operation—bottleneck your whole production schedule—cost countless dollars that could so easily have been saved!**

That's why so many major steel mills standardize on Hyatt Roller Bearings in their rolling tables, lineshafts, cranes, motors, cars and similar vital applications. Down through the years, Hyatts have conclusively proved they *save power—extend equipment life—last longer with less maintenance.* In the long run, the *best* bearings you can buy are the most economical—HYATTS!

Always specify or replace with . . .

HYATT ROLLER BEARINGS

STRAIGHT BARREL TAPER

HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION • HARRISON, NEW JERSEY

Chrysler Corp.

Autos Vie for Speed Titles

COMPETITION in the auto industry is beginning to mean competition once again.

Those Were Days—Perhaps you remember the days when auto competition in this country referred to racing, speed runs and endurance contests as it still does in Europe. In 1903 Daytona Beach, Fla., first came into prominence when Alexander Winton scorched the sands with his Winton Bullet, turning 68.6 mph and contributing to Winton's prominence as well. It's more than dimly possible that some such thought lurks in the minds of the growing number of auto executives making the annual trek to NASCAR's speed week on those same sands.

For while there is an industry understanding that top speed figures will not be given out by manufacturers, the NASCAR event provides an accurate and public record of what the cars present will do. Since the public is going to find out anyway, reasons the public relations gang, it is no more than common sense to be sure the private entrants have the maximum opportunity to represent the product properly. And should the car happen to win in its class, the encouragement of objective reporting of this occurrence is quite innocent stuff also.

Big Deal—Boiled down it means that the automakers have been a victim of that eternal question, "What'll she do?" Each year since the first NASCAR speed week in 1950, interest and participation by the automakers has grown, and this year the deal hit a new high. A number of cars built up specially by the factory were on hand replete with engineers, movie crews and droves of publicity exponents all pointing to their particular pebble on the beach.

The results of careful preparation show up in speeds as much as 10 miles an hour higher for well-groomed cars and tend to make the data below a trifle optimistic for the average guy in his high-

HERE'S HOW THEY DID AT DAYTONA

1955 Stock Production Passenger Cars

Chrysler C300	127.5	Studebaker	111.8	Ford	103.6
Cadillac	120.4	Oldsmobile	111.0	Lincoln	102.1
Chrysler NY	114.6	Dodge	107.5	Plymouth	100.9
DeSoto	112.2	Packard	106.0*	Nash	99.0
Chevrolet	112.1	Mercury	105.0	Pontiac	94.7

* one way only

Sports Cars

Ferrari Monza	170.5	Mercedes 300 SL	133.4	Austin-Healey	111.4
D-Jaguar	164.1	Allard Jr	128.7	Porsche Speedster	91.8
4.9 Ferrari	154.8	Jaguar 140 M	128.0	MG TF	72.9
Cunningham C4R	149.3	Ford Thunderbird	121.9		

way-tuned machine. One car, for example, had been virtually hand-built, with all parts having maximum clearance within the stock tolerance specifications for the car. The engine had been tuned on a dynamometer and the body had been built with as little sealer and other weight-contributing material as possible in order to minimize friction.

Preparation — Grease in most front wheel bearings is replaced with a light oil and the differential contains the lightest possible lubricant as does the transmission which is straight shift if available. Engine oil is SAE 5 or 10 and spark advance is normally from 6 to 12 degrees over normal setting. The spark plug gap usually is decreased to about 0.018 in. Front wheel cones are backed off one or two notches as are brakes to insure against any possible wheel drag.

Tire pressures are a critical and interesting problem owing to the nature of the Daytona Beach surface. Too much pressure reduces traction while too little increases rolling friction. Best average for most cars is about 50 psi, possibly a little more in the front and a little less in the rear.

Special Case—The point of the whole pitch is this: Highway tuning is not even close to the setup that wins at Daytona. Your car is tuned for best performance in the middle ranges and is lubricated for reasonably long life, factors which can be disregarded during a short run with emphasis on the top end.

Perhaps you've looked at the results above and find you turned better than those speeds on the turnpike with your wife's 1949 model of the same make. The answer to that one, of course, is speedometer error versus electric timing over a measured mile. Dead accurate speedometers don't exist even on fifth wheels which have a margin of error. Your speedometer is relatively inexpensive yet gives a relatively good indication of speed. But error multiplies and at the top end most speedometers are 10 to 15 mph optimistic. A Buick Century taken through the traps at an indicated 120 mph last year actually clocked 99.9 mph, a fact it is useful to pass along to your wife.

The Ultimate — That's why in terms of your particular car the results of the runs at Daytona Beach are probably of academic interest despite the fact that running on sand serves somewhat as an equalizer. But looked upon in its proper perspective, Daytona Beach loses little of its attraction. Here engineers and skilled mechanics work together to find out how much can actually be obtained from a stock automobile within the only enforceable definition of "stock." Here in the battle between horsepower and friction, engineers get a look with the public at the ultimate their product can produce compared with their competitors.

Exhaust Notes

An 800,000-sq ft Powerflite transmission plant at Kokomo, Ind., is announced by Chrysler Corp. in a move to double present capacity. Standard transmissions are already being produced in Kokomo while all present Powerflite production is in Indianapolis.

California assembly hits the limelight as Nash and Hudson Ramblers go into production at the El Segundo plant of American Motors Corp. Meanwhile, Fords began to roll off the lines of Ford Motor Co.'s new assembly plant in Milpitas, Calif. Built to replace the outmoded Richmond, Calif, plant, the new facility was visited by STEEL last summer while under construction. For a rundown on the plant which trims man-hours per unit from 34.7 at Richmond to 30, see STEEL, Aug. 9, p. 67. This completion brings to 28 the number of postwar manufacturing and assembly plants built by Ford, as well as 20 parts depots and 14 major engineering, research and office buildings.

Wrap-around windshields, wrap-around rear windows, horsepower hikes and more driver comfort items promise to hit the truck introductions coming up. Dodge will be announcing shortly, followed by GMC. Basic areas of improvement are similar in the two makes, a statement which both consider insulting. Indicative of the horsepower jumps are the Dodge moves to 169 hp versus 145 last year in the ½-ton jobs, with 202 hp in the 3½-tonners from 172 in 1954. Dodge will be shooting to regain third place in 1955.

January motor vehicle sales set a new record for the month, according to official figures of the Automobile Manufacturers' Association. The month's total of 726,108 car and truck sales was more than 100,000 units above the previous record set in 1951 and nearly 175,000 units above the level of January, 1954.

Air conditioning for 1955 Ford eight-cylinder passenger cars and station wagons, which will be sold by Ford dealers as optional equipment, also heats and defrosts in addition to ventilating and dehumidifying. Temperature in the car is controlled by the simple movement of a single lever.

Suggested list price for the five-purpose unit is $435 plus installation, estimated at 10 working hours. Called the Ford Selectaire conditioner, the unit will be installed at Ford dealerships by qualified mechanics specially trained for the job by Ford Division's district service schools.

To avoid reducing available trunk space, the unit is installed in the front end of the car.

Auto, Truck Output

U. S. and Canada

	1955	1954
January	780,780†	594,467
February	774,200*	573,801
March		672,485
April		676,248
May		621,262
June		623,732
July		543,540
August		523,799
September		364,441
October		312,078
November		616,395
December		761,954
Total		6,884,202

Week Ended	1955	1954
Jan. 29	190,468	143,654
Feb. 5	190,140	139,042
Feb. 12	191,136	141,570
Feb. 19	198,066	148,257
Feb. 26	193,233	145,980
Mar. 5	196,600*	139,263

Source: Ward's Automotive Reports. †Preliminary. *Estimated by STEEL.

BEARING PROBLEMS? ------Call on

NEW DEPARTURE

PDQ*!

*

PRICE

Feed-back principles are employed in this ball race form grinder at New Departure. The machine automatically adjusts to maintain specified tolerances. More perfect pieces per hour mean lower costs for the bearing user.

*

DELIVERY

Speed with precision extends to the shipping room. This New Departure wrapping machine seals bearings in protective paper automatically, untouched by human hands. You can count on New Departure to meet the demands of *your* delivery schedule.

*

QUALITY

Quality control is of prime importance in the high-volume, ultra-precision manufacture of ball bearings. Balls are automatically inspected by an electronic scanning device that operates with a speed and accuracy considered to be impossible a few years ago.

PLUS ENGINEERING SERVICE

New Departure engineers are ready to help with your ball bearing problems. And when you consult with New Departure you get the benefit of more than 50 years' experience in ball bearing design and manufacture. Call, wire or write ... New Departure can help you ... PDQ!

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONN.

NEW DEPARTURE

BALL BEARINGS

NOTHING ROLLS LIKE A BALL

Only GRAPH-MO® gives you all three advantages in one tool steel

Wearability—*Outwears other tool steels 3 to 1*

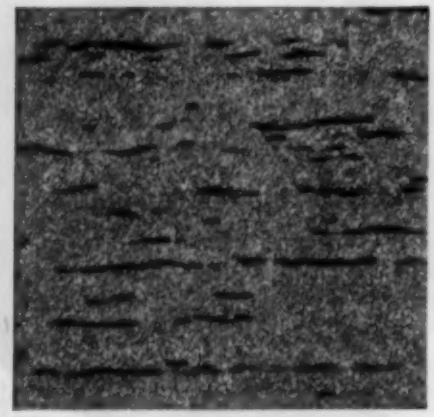
Stability—*Is the most stable gage steel ever made*

Machinability—*Cuts machining time 30%*

YOU can make gages and dies that stay accurate longer and produce them in less time by using Graph-Mo® graphitic tool steel. That's because only Graph-Mo gives you the combination of wearability, stability and machinability that you want in a tool steel.

Free graphite and diamond-hard carbides in the structure of Graph-Mo steel give gages and dies extraordinary life. Reports from users show that Graph-Mo outwears other tool steels 3 to 1.

In your plant, Graph-Mo steel will cut production time and rejects. Because of its graphitic structure, Graph-Mo steel machines 30% faster than other tool steels. This structure also gives excellent resistance to abrasion, and has minimum tendency to pick up, scuff or gall. Tests on Amsler Wear Machine show Graph-Mo has twice the resistance to galling when compared with ordinary tool steels.



100X

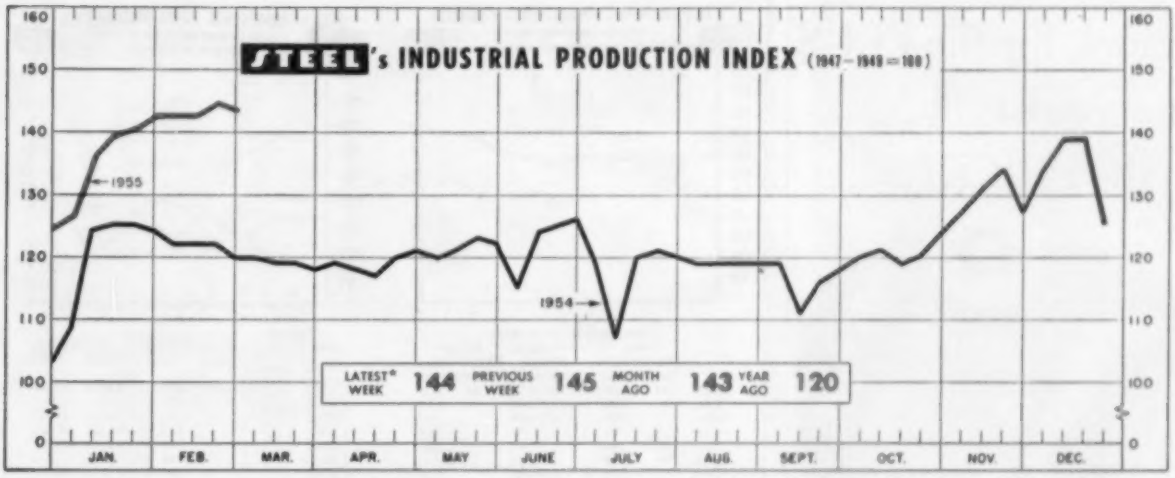
The greater stability of Graph-Mo steel enables you to make gages that stay accurate longer. After 12 years of service, for example, a typical Graph-Mo steel master plug gage showed less than 10 millionths of an inch change from its original dimensions.

You can always tell Graph-Mo steel by its "graphitic look"—the tiny, scattered, parallel marks barely visible on the surface of a piece of polished Graph-Mo. This built-in "trade-mark", the result of free graphite in its structure, can't be duplicated in ordinary steels. The photomicrograph at left shows the free graphite and diamond-hard carbides that give Graph-Mo unusual wear resistance.

Write today for more information on Graph-Mo steel. The Timken Roller Bearing Company, Steel and Tube Div., Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



*Week ended Feb. 26. Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Auto Assemblies 11%.

'Little Upturns' Give Business Added Strength

THE BUSINESS UPSWING that began last fall has lots of oomph behind it. It's true that standout performers like steel, autos and construction tend to steal the show. But other industries are having their own substantial though unspectacular pickups.

It adds up to a solid cushion to absorb a good share of any second-half letdown if the leaders falter.

Full Steam — Here's the way some facets stack up: The nonferrous industry on the whole is running full steam ahead. Some of the metals are in short supply, with fabricators snapping up all they can get.

Machine tool builders hit their 1954 peak in December. January orders were even better, and volume held up well in February. Some slackening is probably due, but the fast start will help smooth out any sag.

Satisfactory — In another area of producers' goods, Lorenz Iversen, president, Mesta Machine Co., says this about his company: "The continual expansion and modernization program of the steel industry, together with orders expected to materialize in the near future, indicate that 1955 should be another year of satisfactory operations."

Appliances are perking along on a high level for the beginning of a year. Home laundry appliances topped the $1-billion mark last year and apparently aren't slowing down much going into 1955. Radio and television are off to fast starts, considerably above a year ago.

Ahead—Department store sales wound up 1954 just about equal to record 1953. So far this year they're ahead and bidding to stay that way.

Railroads, too, are getting a share of increased business. Freight car loadings are out in front of last year and due for a seasonal rise in about a month. Though the roads aren't out of the woods yet, they may open their pockets a little wider in 1955 than

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,172	2,191	1,686
Electric Power Distributed (million kwhr)	9,907[1]	9,912	8,396
Bitum. Coal Output (1000 tons)	8,875	8,690	7,245
Petroleum Production (daily av.—1000 bbl.)	6,725[1]	6,767	6,303
Construction Volume (ENR—millions)	$312.2	$193.9	$225.7
Automobile, Truck Output (Ward's—units)	193,233	196,644	145,980
TRADE			
Freight Car Loadings (unit—1000 cars)	648[1]	655	595
Business Failures (Dun & Bradstreet, no.)	178	205	204
Currency in Circulation (millions)[3]	$29,793	$29,743	$29,838
Dept. Store Sales (changes from year ago)[3]	+5%	+1%	+1%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$17,115	$20,276	$16,324
Federal Gross Debt (billions)	$278.3	$278.3	$274.7
Bond Volume, NYSE (millions)	$15,640	$20,456	$14,416
Stocks Sales, NYSE (thousands of shares)	11,502	16,818	6,205
Loans and Investments (billions)[4]	$84.7	$84.9	$79.9
U. S. Gov't. Obligations Held (billions)[4]	$35.1	$35.3	$32.3
PRICES			
STEEL's Finished Steel Price Index[5]	194.53	194.53	189.74
STEEL's Nonferrous Metal Price Index[6]	227.3	226.7	201.3
All Commodities[7]	110.3	110.3	110.5
Commodities Other Than Farm & Foods[7]	115.4	115.4	114.3

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1955, 2,413,278. 1954, 2,384,540. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

For Stampings

...look for the PLUS

beyond

the PRICE!

delivery for instance!

Think what it costs when your stampings aren't delivered on time.

Remember that *prompt delivery* – with a 39-year record to prove it – is just one of the plusses you get when you buy *Detroit* stampings.

Look for the plusses *beyond* the price the next time you buy stampings!

And be sure to try DETROIT

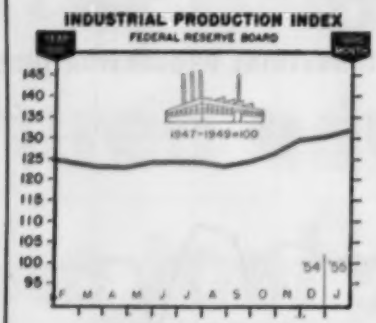
DETROIT STAMPING COMPANY

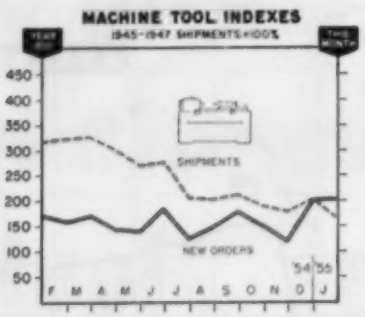
DE-STA-CO

359 Midland Ave., Detroit 3, Mich.

"America's Best-Known Jobbing Stampings Manufacturer"

THE BUSINESS TREND





(seasonally adjusted)

	Total Production		Primary Metals		Metal Fabricating	
	1955	1954	1955	1954	1955	1954
Jan.	131*	139	123*	111	157*	155
Feb.	...	124	...	108	...	152
Mar.	...	123	...	103	...	148
Apr.	...	123	...	104	...	146
May	...	124	...	106	...	147
June	...	124	...	106	...	145
July	...	124	...	104	...	148
Aug.	...	123	...	105	...	148
Sept.	...	124	...	117	...	148
Oct.	...	126	...	110	...	149
Nov.	...	129	...	116	...	155
Dec.	...	130	...	120	...	156
Avg.	...	125	...	110	...	150

Federal Reserve Board. *Preliminary

Charts Copyright 1955 STEEL.

	New Orders		Shipments	
	1955	1954	1955	1954
Jan.	203.6*	173.5	167.8	319.4
Feb.	....	159.8	....	323.1
Mar.	....	169.6	....	327.3
Apr.	....	142.8	....	302.7
May	....	139.5	....	270.3
June	....	185.2	....	276.3
July	....	124.7	....	205.7
Aug.	....	147.9	....	203.7
Sept.	....	180.9	....	213.4
Oct.	....	145.9	....	191.0
Nov.	....	119.5	....	179.6
Dec.	....	202.9	....	203.4

*Preliminary.

National Machine Tool Builders' Assn

was expected by many onlookers.

Steel Gains—Among the pace setters: Steel is enjoying its best weeks since mid-1953. Ingot output is above 90 per cent of capacity—not bad when you figure that 10 to 15 per cent of capacity is usually figured as reserve.

Then there are autos. George P. Hitchings, Ford Motor Co. economist, estimates that sales of passenger cars in the first quarter of 1955 will exceed those for the same period of last year by 33 per cent, the 1953 period by 20 per cent.

No Letup—High demand is responsible for high production, another auto spokesman says. Making for soaring output are: 1. Higher purchasing power in the hands of consumers who aren't afraid to spend because of the general business pickup. 2. New, improved models. 3. Need in some cases to bring dealer stocks up to normal. 4. Scare buying (a relatively small factor) against possible strikes, higher prices or a worsening international situation.

Construction Shows Stamina . . .

In construction, the number of building permits in January was the second highest in history, says Dun & Bradstreet Inc. The pace doesn't show signs of abating.

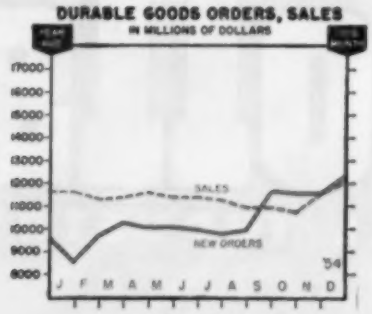
Heavy construction contracts hit $312 million the latest week reported by *Engineering News-Record*. Awards for the first eight weeks of 1955 are 55 per cent over last year, though still 8 per cent under 1953's jack rabbit start.

Private building is a booster. Particularly encouraging is industrial building, up 65 per cent from 1954. Many predictions were that industrial construction would be off this year, but it hasn't weakened yet. Federal contracts, a weak spot last year, are up 79 per cent, another sign that the construction boom goes on.

As the PAs See It . . .

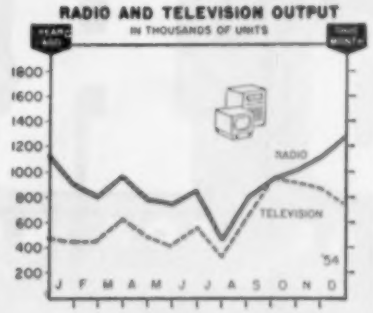
Reinforcing belief in a rising business trend is the latest monthly report of the Business Survey Committee of the National Association of Purchasing Agents. Some 43 per cent report higher production; 49 per cent report no change. Specially promising is the report of 55 per cent that new orders are up, the highest number saying that since September, 1950.

The consensus is that business conditions are good. The order



	New Orders*		Sales*	
	1954	1953	1954	1953
Jan.	8,475	12,454	11,580	12,508
Feb.	9,629	12,416	11,278	12,666
Mar.	10,206	12,520	11,385	13,116
Apr.	10,021	12,702	11,502	13,398
May	10,050	13,101	11,344	13,148
June	9,985	12,392	11,395	13,166
July	9,700	11,600	11,287	13,410
Aug.	9,978	10,139	10,952	12,730
Sept.	11,699	10,110	10,933	12,698
Oct.	11,478	9,677	10,664	12,376
Nov.	11,531	9,631	11,569	11,867
Dec.	12,311	9,567	12,042	11,576

*Seasonally adjusted U S Office of Business Economics



	Radio		Television	
	1954	1953	1954	1953
Jan.	872	1,093	421	719
Feb.	789	1,192	427	731
Mar.	940	1,549	600	810
Apr.	745	1,159	458	568
May	723	1,109	396	482
June	838	1,164	544	524
July	438	674	307	316
Aug.	765	992	633	604
Sept.	932	1,217	948	770
Oct.	998	1,053	921	680
Nov.	1,099	1,066	859	560
Dec.	1,262	1,101	833	450
Total	10,400	13,368	7,347	7,214

Radio-Electronics-Television Mfrs. Assn

backlog is comfortable, and production is high. But the 8 per cent who report production and orders down are outspoken in giving their side of the story.

Another sign of strength: Inventories are balanced. Over 80 per cent say inventories are holding steady or are rising to offset better business. Nearly all the purchasing executives are satisfied with their present position. That's one reason inventories aren't going up: The PAs don't want to lose their present good situation by second-guess buying against strikes or a change for the worse in world affairs.

Buying Lengthens . . .

Still, buying is getting to be of the longer term variety. Only 76 per cent are in the 0 to 60-day range, compared with 95 per cent in that bracket last month. Some of the buying ahead was on items in short supply and "bargains."

As might be expected, the PAs put on the short-supply list: Copper, nickel, prime aluminum, galvanized steel sheets, cold-rolled sheets and some hot-rolled sheets.

Prices are up, say over half the PAs, the largest number reporting increases since February, 1951. Somewhat offsetting price hikes is tight competition which is keeping other prices down.

Hiring Ahead . . .

Employment is high; skilled technical and clerical help is in demand. But unskilled labor is overabundant in some areas. A slow but steady pickup in employment is expected as spring approaches.

That's good news in the face of many predictions of sharply rising unemployment because of technical advances. Cited as at least part proof of technological unemployment is the recent jump made by industrial production without a corresponding increase in employment. Often overlooked is that many plants were working less than a regular work week until late last year; to up output, the plants just lengthened the work week.

Atoms for Execs . . .

Executives who want to know about atomic energy get a one-week course in the fundamentals. Set up for nonscientifically trained business leaders, the course will be given by the National Industrial Conference Board on Apr. 25-30 and June 20-25.

Ohio Rolls

SHAPING METAL FOR ALL INDUSTRY

This handsomely lighted and spacious building houses the finest equipment obtainable for machining Ohio Rolls, made in the world's most modern, exclusive roll foundry.

THE OHIO STEEL FOUNDRY CO.

LIMA, OHIO • PLANTS AT LIMA AND SPRINGFIELD, OHIO

WILLIAM H. FOSTER
. . . Pittsburgh Gear gen. mgr.

William H. Foster was named general manager of **Pittsburgh Gear Co.**, Pittsburgh, subsidiary, Brad Foote Gear Works Inc. He most recently was manager, gear jobbing division, W. A. Jones Foundry & Machine Co., Chicago.

Fred L. Amter was named sales manager of **Federal Carbide & Cutter Co. Inc.**, Rochelle Park, N. J. He had been with Easter Cutter Corp. for many years as a tool sales engineer.

Universal-Cyclops Steel Corp., Bridgeville, Pa., appointed **Uriah W. Davis** chief metallurgist for its Titusville, Pa., plant.

George D. Billock joined **Hubbard & Co.**, Pittsburgh, as vice president and treasurer. He was formerly with Latrobe Steel Co. as assistant treasurer.

R. W. Rosenquest was made manager of sales, **Stella Products Corp.**, Livingston, N. J.

Firth-Loach Metals Inc., McKeesport, Pa., appointed **Robert C. Lindberg** superintendent of production, and **William C. Seitz** as manager, research and development.

Marshall Steel Co., La Grange, Ill., appointed **Gilbert R. Jarman** general sales manager. For the last ten years he has been with Columbia Tool Steel Co.

STEPHEN D. MOXLEY
. . . heads American Cast Iron Pipe Co.

American Cast Iron Pipe Co., Birmingham, elected **Stephen D. Moxley** president to succeed **Charles O. Hodges**, retired. Mr. Moxley was executive vice president. **Frank H. Coupland** was made vice president and works manager; **Arnold J. Herrmann**, vice president and sales manager; **Kenneth R. Daniel**, vice president and chief engineer; and **A. E. Bowen**, treasurer.

K. H. Hulbert was made general sales manager for **Cornwell Quality Tools Co.**, Mogadore, O.

Rochester Products Division, General Motors Corp., at Rochester, N. Y., appointed **E. A. Kehoe** director of quality control.

John R. O'Connor fills the newly created post of central division sales manager of **Graver Tank & Mfg. Co.** He has headquarters in East Chicago, Ind.

Paul L. Gallagher was made manager of pipe sales for **Claymont Steel Products**, department of Colorado Fuel & Iron Corp. He is at the sales office in Wilmington, Del.

Arthur J. Redmond was appointed a vice president of **Allied Products Corp.**, Detroit.

John S. Roller was made Detroit district sales manager of **Firth Sterling Inc.**

N. DOUGLAS MacLEOD JR.
. . . Abrasive Machine Tool exec. v. p.

N. Douglas MacLeod Jr. was named executive vice president of **Abrasive Machine Tool Co.**, East Providence, R. I. In 1951 he was made production manager, and served in that capacity until 1954 when he was promoted to assistant general manager.

M. C. Patterson and **R. S. Bright** were elected vice presidents of the **Dodge Division**, Chrysler Corp., Detroit. Mr. Patterson will be in charge of manufacturing. Mr. Bright will have a wide variety of executive duties, as well as overall direction of the Nine Mile press plant and the Dodge plants at Indianapolis, New Castle and Kokomo, Ind.

Edgewater Steel Co., Pittsburgh, elected **George C. Gentry** director of engineering and development; **Ross M. Heyl**, general superintendent; and **Paul J. Nicholas**, operating superintendent.

Edward E. Anderson was elected a vice president of **Metal & Thermit Corp.**, and placed in charge of the western operations of the firm. He is succeeded as head of the South San Francisco plant by **Murray C. Gautsch.**

Carroll V. Roseberry was made manager of the newly formed electric utility and transportation sales department of **Westinghouse Electric Corp.**, Pittsburgh. **C. F. Spons-**

ELDEN T. DAVIS
. . . David Round & Son v. p.-gen. mgr.

T. V. PURVIN
. . . general manager of AMgears

HARRY O. WHIPPLE
. . . to manage new Rockwell plant

ler was made manager of its transportation section.

Elden T. Davis, vice president-controller, Cleveland Chain & Mfg. Co., was elected vice president and general manager of **David Round & Son Inc.,** Cleveland. He has been engaged in liquidating assets for the former owners of Cleveland Chain, which was purchased last year by Republic Steel Corp.

Columbia-Southern Chemical Corp., Pittsburgh, elected **Robert L. Hutchison** and **Joseph A. Neubauer** vice presidents. Mr. Hutchison was made vice president-operations, and was elected a director to succeed **Dwight R. Means,** vice president, who has resigned as a director and is on a half-time basis. Mr. Neubauer was made vice president-research and development.

George A. Short was made chief engineer, **Cleveland Fuel Equipment Co.,** Cleveland. For the last 18 years he was development and sales engineer at Hotstream Heater Co.

Alfred A. Gareri was named sales manager of **Franke Gear Works Inc.,** Chicago.

Quentin F. Ebert was made director of purchases for **Columbia-Southern Chemical Corp.,** Pittsburgh.

R. W. Carr was named purchasing agent of **Ryan Aeronautical Co.,** San Diego, Calif.

T. V. Purvin was appointed general manager of **AMgears Inc.,** Chicago, responsible for manufacturing, engineering and sales. AMgears, a subsidiary of Hupp Corp., operates plants in Cleveland, Detroit and Chicago.

L. L. Cook was promoted to district works manager at **Laclede-Christy Co.,** division of H. K. Porter Company Inc., at St. Louis.

Nicholas Kowall was promoted to superintendent, steel division, **Superior Steel & Malleable Castings Co.,** Benton Harbor, Mich. He was formerly superintendent, cleaning division, steel foundry.

Acme Steel Products Division, Acme Steel Co., Chicago, appointed **K. J. Pedersen** central area sales manager; **C. C. Turner** eastern area sales manager; and **G. R. Easley** southern area sales manager. Their respective headquarters are at Chicago, New York and East Point, Ga., a suburb of Atlanta.

W. Jacques Schuler was elected vice president-sales, and **Walter L. Kaufman** vice president-engineering of **Lovell Mfg. Co.,** Erie, Pa.

Ralph K. Anders was elected vice president-engineering, **Atlas Engineering Co.,** Ventura, Calif.

Iron Fireman Mfg. Co., Cleveland, elected **Wayne F. Strong** president; **W. J. O'Neil, C. T. Burg, E. C. Webb, L. J. Cox** vice presidents; and **C. C. Craft** secretary.

Harry O. Whipple, former factory manager of **Rockwell Mfg. Co.'s** Columbus, O., plant, was named general manager of a new plant to be built at Russellville, Ky. Construction is expected to get under way in March.

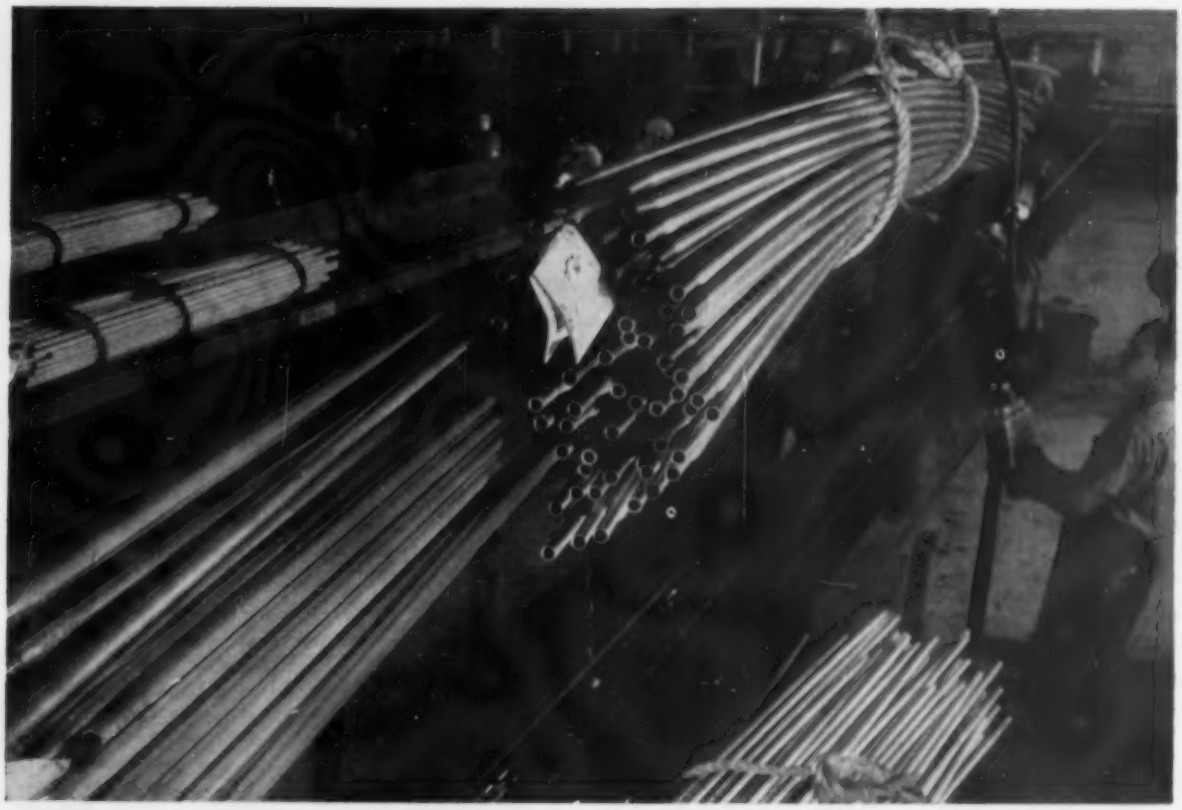
Rae Hasselbring was made manager of industrial metals for **Southern States Iron Roofing Co.,** Savannah, Ga. He was manager of the aluminum department of Hubbell Metals Inc., St. Louis.

Harold V. Williams was promoted to assistant sales manager, **Buflovak Equipment Division,** Blaw-Knox Co., Buffalo. **Robert H. Hazlett** was made gas equipment sales manager. **Edgar L. Demarest** was made district sales manager at Philadelphia, and is assisted by **Warren V. Eisenhuth.**

Eugene Easterly was appointed vice president-distribution, and **E. G. Hickling,** vice president-operations of **Linde Air Products Co.,** a division of Union Carbide & Carbon Corp., New York.

R. Lee Mitchell was named general manager, railroad sales division, **New York Air Brake Co.,** New York. **K. E. Keiling** retired as vice president in charge of railroad sales, but continues as a director.

Harold C. Warner was appointed Midwest district manager at Chicago for **Luria Engineering Co.** He succeeds **E. Gordon Ball Jr.,** recently advanced to vice president



Good News about Titanium!

SUPERIOR TITANIUM TUBING NOW AVAILABLE IN A WIDE RANGE OF SIZES, FORMS, TEMPERS

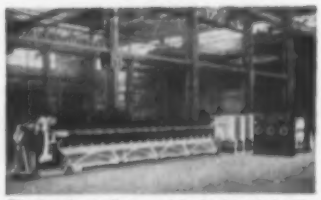
The big news about titanium these days is not its high strength to weight ratio; its formability; its corrosion, heat and electrical resistance. Engineers know all this. What they want to know is *when*. The answer is *right now*, as far as tubing is concerned.

Although everything is special as far as the production of titanium tubing is concerned—more grinding operations are required, special lubricants have to be employed, drawing schedules have to be much lighter, annealing must be done in special furnaces, special pickling solutions are demanded—the end result is always a standard tubing obtainable from Superior distributors coast to coast. Sizes range in O.D. from .012" up to 1.50", in wall thickness from .002" to .187", and in lengths up to 24 feet. Tempers—fully annealed, half hard and full hard. Forms—Seamless and Weldrawn®.

Applications are increasing rapidly. They now range from use in the atomic energy programs—to low stress aircraft structural parts—to pneumatic, hydraulic, refrigeration lines—to processing lines in the chemical industry.

Write now for your free copy of Bulletin 43—it contains complete technical and ordering information—and for the name of the Superior distributor nearest you. SUPERIOR TUBE COMPANY, 2005 Germantown Ave., Norristown, Pa. *On the West Coast:* Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif.

Round and shaped tubing available in Carbon, Alloy and Stainless Steels; Nickel and Nickel Alloys; Beryllium Copper; Titanium; Zirconium



Titanium is reactive, must be heat treated without atmospheric contamination. This vacuum annealing furnace handles material 24 feet in length, operates at temperatures up to 1850°F, is automatically controlled.

All you need to know about titanium tubing is contained in this newly revised 8-page booklet—Bulletin 43. Contains processing information, properties, advantages and end uses; describes sizes, forms and tempers available.

Superior Tube

The big name in small tubing

All analyses .010" to ⅛" O.D. Certain analyses in light walls up to 2½" O.D.

CARL F. LEITTEN
. . . Electro Refractories exec. v. p.

GEORGE W. McCARTY
. . . Black & Decker chief engineer

HARRY R. ROWLAND
. . . A. M. Byers gen. sales mgr.

in charge of sales at the Bethlehem, Pa., fabricating plant.

Carl F. Leitten, since 1943 vice president-manufacturing at **Electro Refractories & Abrasives Corp.,** Buffalo, was elected executive vice president. Mr. Leitten is also vice president of Electro Refractories & Abrasives Canada Ltd., and has been managing director of that raw material subsidiary since 1949.

Paul S. Dougherty Jr. was elected president of **Metal Coating Corp.,** Chicago, to succeed his father, the late **Paul S. Dougherty. Clarence O. Mumford** was elected vice president in charge of production.

Warner B. Bishop Jr. was elected assistant vice president of **Archer-Daniels-Midland Co.,** foundry products division, Cleveland.

Black & Decker Mfg. Co., Towson, Md., appointed **George W. McCarty** chief engineer. He succeeds the late **Glenn C. Wilhide.** Mr. McCarty formerly served as plant manager at Hampstead, Md.

Donald C. Heyel was made manager of a new sales district established by **Kaiser Aluminum & Chemical Sales Inc.** in St. Louis.

Charles E. Bosworth was made assistant general purchasing agent of **Ford Division,** Ford Motor Co., Dearborn, Mich. He succeeds **James O. Wright,** who was appointed director of purchasing.

William B. Adair, chief sales engineer for the Houston division of **Macco Oil Tool Co.,** was promoted to chief engineer.

Harry R. Rowland was elected general manager of sales, **A. M. Byers Co.,** Pittsburgh. He formerly served as assistant general sales manager. **Edgar L. Fix** was appointed manager of steel sales; **V. C. Lawrence,** manager of the New York division; and **A. N. Voripaieff,** manager of the marine and international division. Mr. Lawrence succeeds **D. B. McDonald,** retired.

J. Joseph Kelly was appointed sales manager of **Reed-Prentice Corp.,** Worcester, Mass., affiliate of Package Machinery Co.

Stanley A. Ashyk was made plant mechanical engineer, and **Edward H. Mroz** plant industrial engineer of the Elyria, O., plant of the steel and tube division of **Republic Steel Corp.**

OBITUARIES . . .

Thomas S. Quinn, 67, co-founder and treasurer, **Lebanon Steel Foundry,** Lebanon, Pa., died Feb. 20.

Walter P. Balderston, 71, founder and chairman of **Sturges Inc.,** Los Angeles, died Feb. 10.

Frank H. Schoenfeld, 61, founder and president, **Ajax Thermostatic Controls Corp.,** Cleveland, died Feb. 18.

C. Sanford Bull, vice president, **Waterbury Cos. Inc.,** Waterbury, Conn., died at his home Feb. 24.

F. C. Kingston, founder and president, **F. C. Kingston Valve Co.,** Los Angeles, died Feb. 19.

Jacob K. Niven, 63, vice president and general manager of **Olin & Peters Inc.,** San Diego, Calif., died Feb. 12.

John K. Underwood, assistant to vice president-sales, **Tennessee Coal & Iron Division,** Birmingham, U. S. Steel Corp., died Feb. 16.

G. O. Gondee, 69, secretary, **Struthers Wells Corp.,** and general manager of its Titusville, Pa., division, died Feb. 17.

Leopold Strahs, 77, founder and president of **Strahs Aluminum Co. Inc.,** New York, died Feb. 17.

Frederick J. Vlaskamp, 53, president, **Fenton Foundry Supply Co.,** Dayton, O., died Feb. 17.

Robert B. Haynes, 56, vice president-manufacturing, **Dana Corp.,** Toledo, O., died Feb. 25.

James R. O'Connell, 64, general plant superintendent of **Hardinge Bros. Inc.,** Elmira, N. Y., died Feb. 21.

'round the clock with CF&I-WICKWIRE WIRE

In this advertisement we continue to take you through a typical day in the life of John Q. Citizen... showing you the part CF&I-Wickwire Wire plays in his everyday activities.

OFFICE BUILDING—8:55 A.M. John never stops to think about it but he rides up to work on dependable elevator cable. Without this indispensable wire product—much of it made of CF&I-Wickwire Wire—modern multi-story buildings would be unable to function.

OFFICE—9:00 A.M. Here we are, inside John's office. Where is the wire? All around us. Paper clips inside the desks. Springs inside the telephones and the typewriters—even under John's swivel chair. Staples, coat hangers, ring binders—these and countless other office necessities are made from wire—very often of CF&I-Wickwire Wire.

FACTORY—3:00 P.M. Let's accompany John on a trip to his firm's nearby factory. The premises are inclosed by a wire fence. Inside, we find wire mesh cloth used as machinery guards. Metal processing belts made of woven wire. Springs of every variety to keep the machines going. All of these products use CF&I-Wickwire Wire.

Watch for the balance of John's day in our next advertisement which takes John back to his home and the relaxation of his living room.

For the Wire You Require — Check CF&I-Wickwire

CF&I-WICKWIRE WIRE

THE COLORADO FUEL AND IRON CORPORATION

WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia
THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Ft. Worth • Houston
Lincoln (Neb.) • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • Seattle • Spokane • Wichita

2692

spot the champ

... and with high speed steels the champion's always REX

Compare the freckles and you'll pick the champ. And it's easy to spot the champ in high speed steels, too, for Crucible REX® has been the *standard of comparison* for over half a century.

Prove the reasons for REX's superiority in your own shop. You'll like its hardenability... response to heat treatment ... fine tool performance. Like thousands of other users, you'll agree *you can't find a high speed steel to outperform REX.*

Ask for REX, a *prescription-made* Crucible product, at Crucible warehouses or leading distributors from coast to coast. *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 30, Pa.*

Visit us at Booth 350
Western Metal Show
Los Angeles—Mar. 28-Apr. 1

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

Company Reorganizes

Merritt-Chapman & Scott's activities grouped within four operational divisions

EXTENSIVE organizational realignment of Merritt-Chapman & Scott Corp., New York, is designed to effect maximum administrative and operational co-ordination of its expanded scope of industrial activity. The firm's activities are grouped within four major operational divisions: Construction, steel, equipment and manufacturing. The plan also makes provision for future establishment of shipbuilding and paint and chemical divisions.

William Denny, executive vice president and general manager, continues as chief officer of the company's Construction Division, in charge of construction, marine salvage and derrick operations. Lewis M. Schott is executive vice president in charge of administration; R. O. Baum, executive vice president in charge of procurement, trade relations and insurance; and Marshal G. Staub, executive vice president in charge of finance. He continues as treasurer.

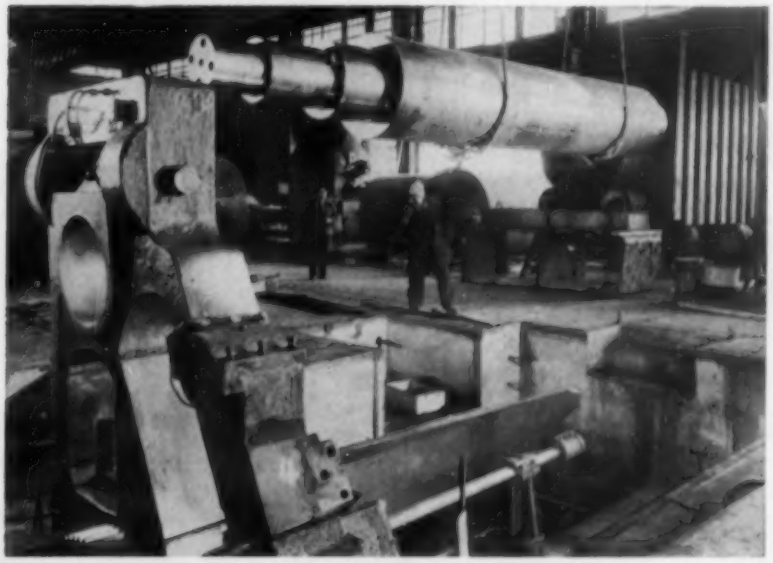
Steel Division—Robert E. Harvey is executive vice president in charge of the Steel Division, comprised of Newport Steel Corp., Newport, Ky., and Milton Steel Products Division, Milton, Pa.

Milton T. Smith is executive vice president in charge of the Equipment Division, comprised of the Marion Power Shovel Co. and its subsidiary, Osgood Co., both of Marion, O., and Construction Improvements Ltd., Toronto, Ont. The latter company is a subsidiary of C. A. Pitts General Contractor Ltd., Toronto, acquired by Merritt-Chapman & Scott late in 1954 as a Canadian subsidiary.

In addition to all construction operations, the Construction Division also includes Merritt-Chapman & Scott's marine salvage, derrick and inland salvage departments. The Fitz Simons & Connell Dredge & Dock Co., Chicago, and C. A. Pitts General Contractor Ltd. are among the construction subsidiaries included in this division.

The firm's Manufacturing Division, for which an executive vice president will be named, will direct the operations of Utah Radio

(*Please turn to page* 90)



Blaw-Knox Buying Equipment for its Buffalo Plant

This 100-ton, pinch-type roll will form 12-ft-wide plates up to 2.5 in. thick at 60,000 lb tensile strength. Blaw-Knox Co. is installing it at its Buflovak Equipment Division, Buffalo. More than $500,000 will be spent on new equipment for the plant. The firm's process equipment department is being integrated into this enlarged division as one of the first phases of Blaw-Knox's $15-million modernization program. Buflovak's facilities will include a captive cast iron foundry, fabricating plant for light and heavy plate work and a large heavy machine shop

For hand-in-glove mileage

be sure to order Jomacs

Flexibility and hard wear are qualities that make Jomac® Work Gloves your best buy in hand protection. Describe your plant operations, temperature conditions, etc., and we'll gladly recommend an economical Jomac for the job, and send you a free sample pair. Jomac Inc., Dept. E, Philadelphia 38, Pa.

JOMAC 644—SAFETY CUFF GLOVES, made of extra-heavy Jomac cloth, give maximum protection to workers' hands. They outwear leather gloves, retain flexibility, can be cleaned and reconditioned many times. Reversible—fit either hand, any two make a pair.

It pays to keep Jomacs on hand

JOMAC

INDUSTRIAL WORK GLOVES

Outwear ordinary work gloves by 900%

Plants in Philadelphia, Pa., and Warsaw, Ind.
IN CANADA: Safety Supply Company Toronto.

wanted: lower

The installation of a new Danly Press in any press line can produce exceptional cost-cutting results. This fact has been proved in the production records of leading stamping shops throughout the country. But when you count pieces at the end of a shift, it's the efficiency of the *whole* line that really counts. That's why production chiefs are specifying *complete lines* of new Danly Presses.

Running together as an integrated production unit, Danly Presses turn out more finished stampings per shift—at lower cost and with fewer line shutdowns. This is the kind of performance *you* can expect from Danly Presses. The reasons for it are many: Danly's heavier, more rugged construction gives the reserve strength necessary to meet the demands of continuous peak-load line operation. Automatic oil lubrication saves hundreds of hours of press maintenance. Exclusive electrical and pneumatic control devices permit convenient automation adaptability and increased safety. Danly's cooler running clutch and brake wear longer, need less replacement. From blanking to finished stamping, every Danly Press delivers more work per shift. Write to Danly today . . . experienced press engineers will be glad to discuss your specific stamping problems.

DANLY MACHINE SPECIALTIES, INC.

2100 South Laramie Avenue, Chicago 50, Illinois

DANLY®

HYDRAULIC METALWORKING EQUIPMENT

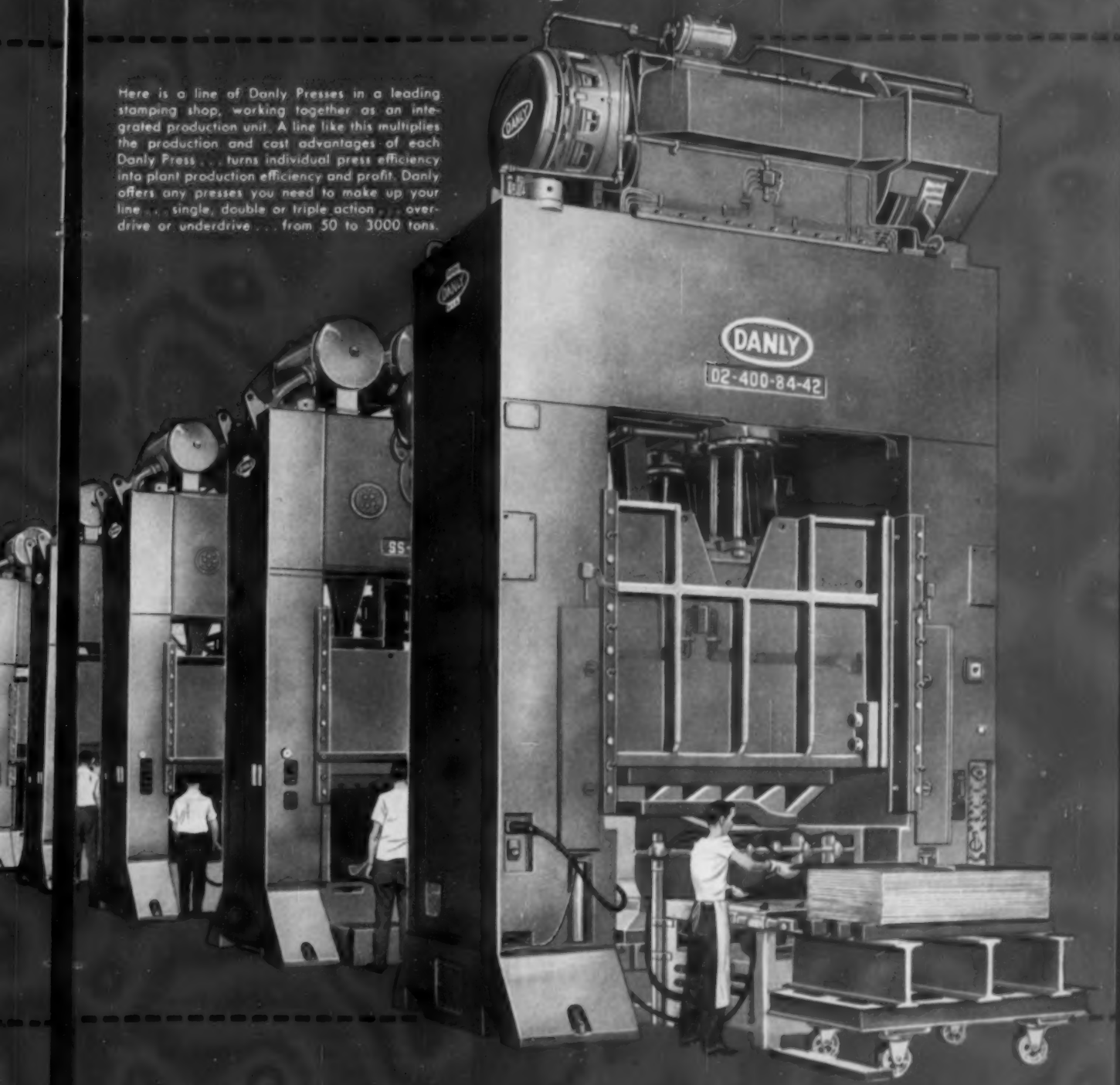
MECHANICAL PRESSES . . . 50 TO 3000 TONS

It costs less to run a DANLY PRESS line!

specify: COMPLE

r cost stamping output

Here is a line of Danly Presses in a leading stamping shop, working together as an integrated production unit. A line like this multiplies the production and cost advantages of each Danly Press . . . turns individual press efficiency into plant production efficiency and profit. Danly offers any presses you need to make up your line . . . single, double or triple action . . . overdrive or underdrive . . . from 50 to 3000 tons.



LETE DANLY PRESS LINES

TUBES · BARS · FORGINGS · WIRE

PETERSON STEELS, INC.
UNION, NEW JERSEY
Detroit, Michigan • Chicago, Illinois

(*Concluded from page 87*)

Products Co. Inc., Huntington, Ind., and Shoup Voting Machine Corp., New York.

Fabricator Plans Expansion

H. H. Robertson Co., Pittsburgh, manufacturer of metal building materials, will build a plant on North road adjacent to the Sparrows Point, Md., plant of Bethlehem Steel Co. The firm is expanding facilities "to handle the new products being developed in the firm's laboratories and at the Mellon Institute of Industrial Research in Pittsburgh."

Allison Co. Changes Hands

American Chain & Cable Co., Bridgeport, Conn., whose Campbell Machine Division produces abrasive cutting machines, purchased Allison Co., Bridgeport, maker of abrasive cutting wheels. Hugh V. Allison will continue as president of the firm bearing his name.

Reopens San Leandro Plant

Gregory Industries Inc.'s Nelson Stud Welding Division, Lorain, O., has resumed limited stud manufacturing operations at its western regional headquarters, 440 Peralta Ave., San Leandro, Calif.

Expands Powdered Metal Unit

United States Graphite Co., a division of Wickes Corp., Saginaw, Mich., purchased a 300-ton hydraulic powdered-metal press as a part of a $250,000 expansion program in its powdered metal department. The press, being built by Baldwin - Lima - Hamilton Corp., Philadelphia, will enable United States Graphite to compact metal powder parts having "H" shaped cross sections and other sections normally difficult to press.

Staude Buys Philadelphia Firm

E. G. Staude Mfg. Co., St. Paul, subsidiary of Bryant Chucking Grinder Co., Springfield, Vt., purchased High Production Machine Co., Philadelphia, maker of setup paper box machinery and an acetate boxmaking machine. Staude makes folding paper box machin-

(*Please turn to page 93*)

Every U. S. Rainbow V-Belt has its own built-in salesman

THE FAMOUS EQUA-TENSIL CORD SECTION

This unique "U. S." development insures that each of the cords pulls its own share of the load—for full strength under all operating conditions. Known as the Equa-Tensil Cord Section, it constitutes a sales point no plant man interested in performance and long life can resist.

U. S. Rainbow® belts have other strong selling points too:

(1) They keep cool under constant stretch and return (because the top rubber cushion is in perfect engineering balance with the lower one).

(2) Inherent stretch is worked out beforehand in the factory, yet enough elasticity is retained to enable the V-Belt to take the heaviest shock loads.

(3) Straight sidewalls grip the grooves the full height of the belt, giving complete contact for greater non-slip pulling power.

Order from any of the 27 "U. S." District Sales Offices, or one of our selected distributors, or write address below.

A COMPLETE DRIVE SERVICE

MULTIPLE V-BELTS • F. H. P. V-BELTS
SHEAVES • FLAT BELTS AND BELTING
SPECIAL PURPOSE BELTS
PowerGrip "TIMING" BELTS AND SHEAVES

See us in Booth #1169
A.S.T.E. Show
Los Angeles, March 14, 18

"U. S." Research perfects it..."U. S." Production builds it... U. S. Industry depends on it.

UNITED STATES RUBBER COMPANY
MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

Hose • Belting • Expansion Joints • Rubber-to-metal Products • Oil Field Specialties • Plastic Pipe and Fittings • Grinding Wheels • Packings • Tapes
Molded and Extruded Rubber and Plastic Products • Protective Linings and Coatings • Conductive Rubber • Adhesives • Roll Coverings • Mats and Matting

A COMPLETE LINE

Fellows Red Liners record all gear errors in combination on a chart as the precision master gear rotates in contact with the gear being checked. Fellows Involute Measuring Instruments. Fellows Lead Measuring Instruments.

In today's intensely competitive economy, competent Gear Inspection Methods and Instruments are VITAL... because waste of tools, materials, and labor must be held to a minimum.

Competent Gear Inspection identifies type of gear inaccuracy immediately... saves production time and gear blanks. If you are making gears for your own use... you will save many man-hours of costly assembly time. If you are making gears for an outside customer... Fellows Instruments will give chart-recorded proof beyond argument of your gear accuracy.

Whether you're making small, fine pitch gears or large coarse ones... whether you want a composite inspection or a check of involute profile or lead... there's a Fellows Inspection Instrument to suit your particular needs. Ask your Fellows Representative to show you *all* the advantages of modern gear inspection methods and instruments for your plant.

THE Fellows GEAR SHAPER COMPANY

Head Office and Export Dept., 78 River St., Springfield, Vt.

Branch Offices: 319 Fisher Bldg., Detroit 2, Michigan • 5835 West North Avenue, Chicago 39, Illinois
2206 Empire State Bldg., New York 1, N. Y. • 6214 West Manchester Avenue, Los Angeles 45, California

(*Concluded from page 90*)

ery, special packaging machinery and rotogravure printing presses. All manufacturing and engineering for both companies will be conducted at the Staude plant in St. Paul.

Wolverine Tube Opens Depot

Calumet & Hecla Inc.'s Wolverine Tube Division, Detroit, opened a mill depot in Minneapolis where it will stock copper water tube, automotive tube and refrigeration tube. E. C. Humphrey Jr. will coordinate the new mill depot operations through Wolverine's Minneapolis office.

Metalworker Shifts Operations

American Associates Mfg. Corp., maker of bottle caps, bath sprays and other metal products, will shift operations, taking over 15,000 sq ft in an Anchor Tool & Die Co. building in Providence, R. I.

Pipe Firm Building Plant

Universal Concrete Pipe Co., Howard county, near Jessups, Md., is building a prestressed concrete pipe plant which is expected to be in production shortly.

J. L. Clark Buys Liberty Can

J. L. Clark Mfg. Co., Rockford, Ill., producer of general line lithographed metal containers and metal specialties, purchased the plant and facilities of Liberty Can & Sign Co., Lancaster, Pa. Roland E. Palmer will be manager of the Liberty Division plant. Ralph C. Rosecrance, president of the Rockford firm, says the Lancaster operation will be supplemented eventually by tools, equipment and work from the home plant.

Ceco Steel Enlarges Facilities

Ceco Steel Products Corp., Chicago, plans a $1-million expansion in plant facilities. Work has started on a $500,000 plant in Broadview, Ill., to house the firm's Chicago area open-web steel joist fabricating department and part of the concrete reinforcing bar operations. Other construction plans include: Doubling the size of the

Proved Under PUNISHMENT

STANDARD CYLINDER TUBING

"Mirror Finished" to precision tolerances, it's used in automobile shock absorbers, power steering, hydraulic pumps . . . without further sizing or finishing.

Here's a busy part of an automobile shock absorber that's built for brutal punishment. It's Standard's modern "mirror-finish" Cylinder Tube. So that it won't weaken or leak under punishment, every inch of this tubular "toughie" must measure up to exacting specifications—in cylinder finish . . . in I.D. tolerances as close as .001" . . . in extreme uniformity of wall thickness and concentricity . . . in internal pressure resistance, to shocks up to 9000 P.S.I. The elimination of broaching or further processing of any kind effect significant savings for our customers in product assembly.

As you see here, the engineering involved behind the application of tubing to your product is *more than skin deep at Standard.* Our engineers will gladly show you why in helping you with your tubular application—whether it involves a simple structural or mechanical member . . . or a precision application.

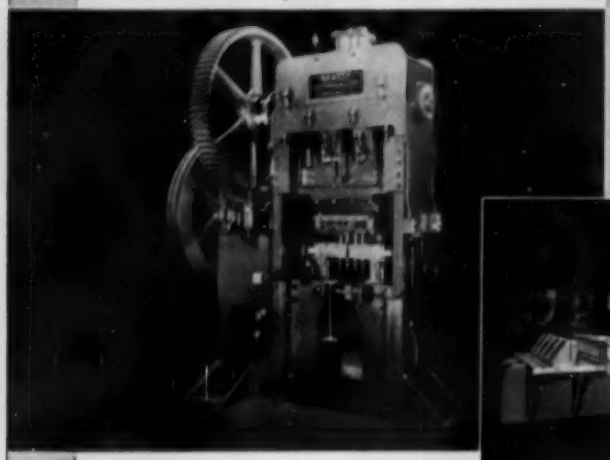
Send for 8-page folder on all Standard products or see Sweet's Design Catalog.

MAKE "STANDARD" YOUR SOURCE FOR—

- WELDED MECHANICAL TUBING
- WELDED STAINLESS TUBING
- BOILER AND HEAT EXCHANGER TUBING
- EXCLUSIVE "RIGIDIZED" PATTERNS

STEEL TUBING SIZES: ½" O.D. TO 5½" O.D.—.028 TO .260 WALL.
STAINLESS SIZES: ¼" O.D. TO 4½" O.D.—.020 TO .154 WALL.

Beatty Beam Punch has
ADJUSTABLE TOOLS
–punches flanges in "I" and WF beams!



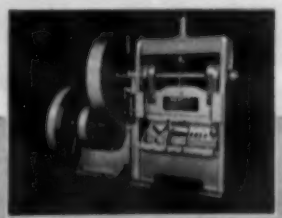
BEATTY Horizontal Hydraulic Bulldozer for heavy forming, flanging and bending.

Here's a new versatile Beatty machine that is ideal for the structural steel fabricator who runs a miscellaneous job shop and requires frequent set-up changes. The new guillotine beam punch, with 200 ton capacity, features built-in adjustable tools for flange punching "I" and Wide Flange beams. A turn of a handwheel provides quick change of punching centers and synchronizes punch with die at the same time. These tools consist of two frames which open and close about the center line of the beam. It has four punching units; minimum inside setting is 2¼", maximum 6¾". Centers between inside and outside punches can be adjusted from 2¼" to 3½". For specific details on improving metal fabricating production—consult your Beatty engineer!

BEATTY Guillotine Beam Punch. Punches webs and flanges in "I" beams from 6 to 30 inches.

BEATTY Spacing Table handles web and flange punching without roll adjustments.

BEATTY Gap Type Press for forming, bending, flanging, pressing. Capacity 200 tons.



BEATTY Guillotine Bar Shear for angles, bars, rounds, squares without changing tools.

BEATTY
MACHINE & MFG. COMPANY
HAMMOND, INDIANA

Chicago district office building; additional warehouse and trucking facilities in Minneapolis; and addition to its Washington warehouse to provide space for a new fabricating unit to be added to the reinforcing steel department; expansion of warehouse facilities in Pittsburgh and Hillside, N. J.

Wilton Tool Buys Rapid Titan

Wilton Tool Mfg. Co. Inc., Chicago, purchased Rapid Titan Mfg. Co., Pentwater, Mich. Assets of the latter company include a valuable patent which incorporates a basic improvement in rapid acting nuts

Plans Steel Fabricating Plant

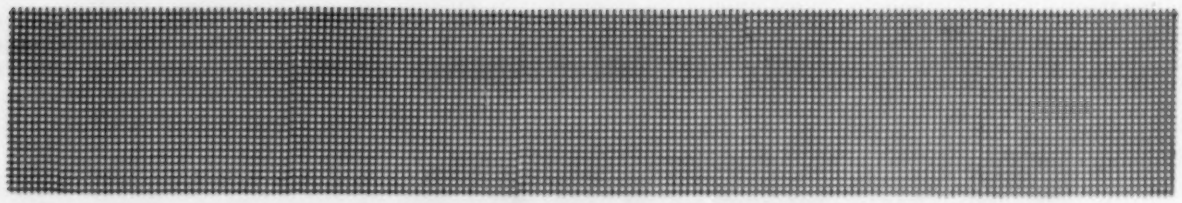
Bancroft & Martin Rolling Mills Co., South Portland, Me., will erect a steel fabricating plant at Brewer, Me. The plant will fabricate plates, structurals and reinforcing bars. Steel culverts and cement pipe for highway construction may be produced later.

Dana Redesignates Units

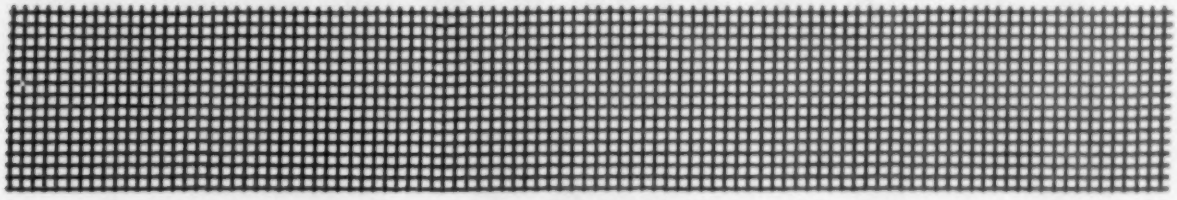
Spicer Mfg. Co., Toledo, O., changed its name to Dana Corp. Divisions include those of Toledo; Pottstown, Pa.; Hillsdale, Mich.; Ft. Wayne, Ind.; Auburn, Ind.;

Wire Moves to Seaway

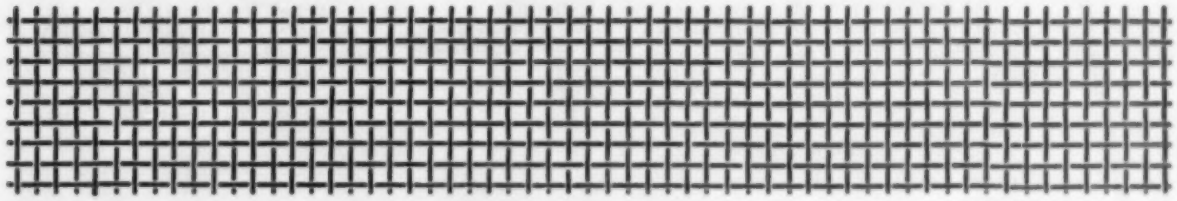
This 8000-lb hydraulic lift will be installed at American Steel & Wire Division's new warehouse at Massena, N. Y. Wire rope, electrical wire and cables and other construction products needed in the St. Lawrence Seaway development will be warehoused



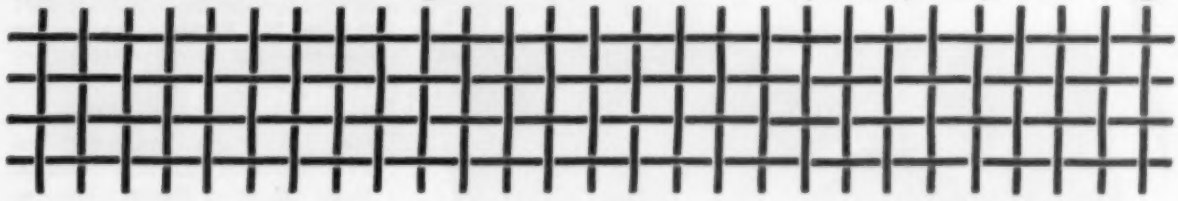
Chase Brass & Copper Industrial Wire Cloth comes



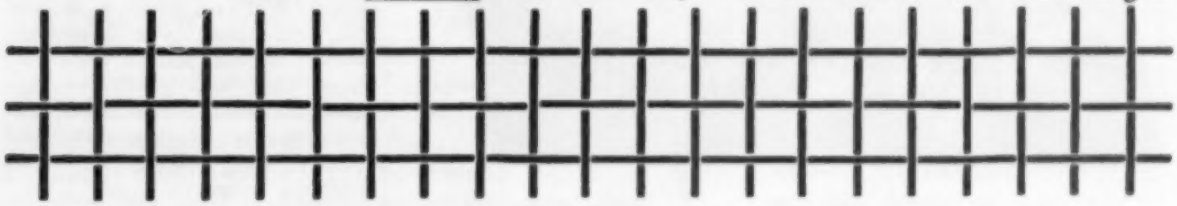
in many meshes (2 to 100): from extra coarse for



door and window grilles... to extra fine for filtering.



But no matter <u>what</u> the size, the mesh is always



uniform – and stays uniform – because...

Chase

BRASS & COPPER CO.

WATERBURY 20, CONNECTICUT • SUBSIDIARY OF KENNECOTT COPPER CORPORATION

... *every wire* in Chase Industrial Wire Cloth is *double-crimped* to keep openings square and true. Do you have a need for wire cloth? Remember – you save when you get the *best*. Order from your nearest Chase warehouse.

The Nation's Headquarters for Brass & Copper

Albany†	Chicago	Detroit	Los Angeles	New York	St. Louis
Atlanta	Cincinnati	Grand Rapids†	Milwaukee	Philadelphia	San Francisco
Baltimore	Cleveland	Houston	Minneapolis	Pittsburgh	Seattle
Boston	Dallas	Indianapolis	Newark	Providence	Waterbury
Charlotte†	Denver	Kansas City, Mo.	New Orleans	Rochester†	(†sales office only)

Simplify your metal joining and Save with EASY-FLO

All you have to do is use a set-up that takes full advantage of the remarkably fast brazing inherent in the properties of EASY-FLO — the low-temperature silver brazing alloy. The float shown here is a good example.

At right are the two parts of the shell with the EASY-FLO wire ring that joins them, and the small slug of EASY-FLO that joins the rod to the shell. Parts and alloy are assembled in the fixture shown below and Handy Fluxed. Gas-air burners are positioned to braze both joints at once.

The one operator turns out 135 floats per hour. They stand 600 to 900 psi pressure.

Photos and data courtesy of Rochester Mfg. Co., Rochester, N. Y.

Metal joining could hardly be any simpler — and a set-up like this is something your shop could cook up and put to work in a hurry. The gas-air burners are available standard products. They're easily arranged to suit different joint requirements. Without obligation we'll send a field engineer to help you work out specific set-up. Write and say when.

Get the amazing EASY-FLO story in Bulletin 20

This 24-page bulletin gives the reasons for the great strength, speed and economy of EASY-FLO brazing — plus valuable tips on joint design and fast production brazing methods. Write for a copy.

HANDY & HARMAN

General Offices: 82 Fulton St., New York 38, N. Y.

DISTRIBUTORS IN PRINCIPAL CITIES

OFFICES and PLANTS
BRIDGEPORT, CONN.
PROVIDENCE, R. I.
CHICAGO, ILL.
CLEVELAND, OHIO
DETROIT, MICH.
LOS ANGELES, CALIF.
TORONTO, CANADA
MONTREAL, CANADA

Marion, Ind.; Aircraft Gear, Ft. Wayne, Ind.; Parish Pressed Steel, Reading, Pa.; Atlas Drop Forge Co., Lansing, Mich.; and General Drop Forge Corp., Buffalo.

Will Fabricate Aluminum

Wolfe & Mann Mfg. Co., Baltimore—switchboards, control panels, special sheet metal products—equipped a special department for the manufacture of aluminum decorative pieces, such as porch and stairway railings. Sales of this department will be supervised by the Aluminum Railing Co., a new organization created by the parent company.

ASSOCIATIONS

Tool & Die Institute, Chicago, elected Harry C. Faust, president of Paragon Spring Co., as its president. Other officers are: Walter Krieger, Three Star Mfg. Co., vice president; Adam F. Gabriel, Acme Industrial Co., treasurer; George W. Rockwood, executive secretary. All firms mentioned are in Chicago.

Association of Steel Distributors Inc., New York, re-elected Paul Goodwin, Eastern Steel & Metal Co., West Haven, Conn., as its national president. Other national officers are: Herman Williams, Williams Steel & Supply Co., Milwaukee, vice president; Gilbert Merrill, Meldon Steel Co., New York, vice president; Seymour Waldman, Rolled Steel Products, Skokie, Ill., secretary; and Walter Ising, Laube Steel Co., Chicago, treasurer.

Edward M. Howard, former Asphalt Institute district engineer, was named field engineer of the **Wire Reinforcement Institute Inc.,** Washington. Working out of Springfield, Ill., Mr. Howard will represent the institute and co-ordinate all its activities with state and city engineers who are constructing fabric reinforced asphaltic concrete projects.

Caster & Floor Truck Manufacturers' Association, Chicago, elected the following officers: President, Kenneth F. Heath, Nutting Truck

CLINIC IN PRINT
FROM THE HOUSE OF STAINLESS

A House of Stainless Service to Answer Your Questions on Stainless Steel

It's our business at the House of Stainless to help you find the SOLUTIONS to your PROBLEMS involving stainless steel, and supply your needs through our complete warehouse stocks or direct mill shipments. CSS metallurgists maintain a library of information covering the application of stainless steels in manufacturing processes and their practical advantages over other material. Any of the booklets listed here are yours for the asking. Just check those you want on the accompanying request form. If you prefer, phone LAfayette 3-7210 for personal attention.

CHECK THE HOUSE OF STAINLESS BOOKLETS YOU NEED

- ☐ How to Fabricate Stainless Steels
- ☐ Heat Treating of Stainless Steels
- ☐ Machining Stainless Steels
- ☐ Welding, Brazing, Soldering and Hot Cutting Stainless Steels
- ☐ Heat Treating, Forging and Pickling Stainless Steels
- ☐ Surface Finishing of Stainless Steels
- ☐ Care and Cleaning of Stainless Steels
- ☐ Metallurgical Aspects of Corrosion—and Heat-resistance of Stainless Steels
- ☐ Fabricating Rigid-Tex Metal
- ☐ Stainless Tubing
- ☐ 300 Series Stainless Steels
- ☐ 400 Series Stainless Steels
- ☐ Properties of Stainless Steels

NAME_____

COMPANY_____

ADDRESS_____

CITY, STATE_____

The House of Stainless — CISCO — OF YOUR SERVICE — STEEL

CHICAGO STEEL SERVICE COMPANY

Kildare Avenue at 45th Street • Chicago 32, Illinois • Telephone LAfayette 3-7210
Mailing Address: Post Office Box 6308, Chicago 80, Illinois

Milwaukee District Office: 757 North Broadway, Milwaukee 2, Wisc. Telephone BRoadway 3-7874
Minneapolis District Office: 3501 Hennepin Avenue, Minneapolis 8, Minn. Telephone COlfax 2602

Sales Representative at Bloomington and Rockford, Illinois; Indianapolis and South Bend, Indiana; Cedar Rapids and Bettendorf, Iowa; Grand Rapids, Michigan; Appleton, Wisconsin.

- ABSORB VIBRATION
- ELIMINATE NOISE
- REDUCE HAMMER BLOW CAUSED BY PRESSURE SURGES
- PREVENT FLANGE BREAKAGE
- CORRECT PIPING MISALIGNMENT

Expansion joints in operation on 2½" suction and discharge pipes.

Sectional view shows sturdy construction of single arch joint. Arrow points to one of steel reinforcing rings.

Garlock rubber expansion joints will stand up under repeated flexing. They are constructed of high grade rubber which is combined with plies of sturdy cotton duck and reinforced with steel rings.

These flexible joints are used in air conditioning and water lines in commercial and institutional buildings and industrial plants to prevent transmission of sound and to absorb vibration, thus saving wear and tear on the pipe flanges. They are made for all pipe sizes ¾" to 72". Write today for Rubber Expansion Joint Folder, AD-137.

THE GARLOCK PACKING COMPANY, PALMYRA, N. Y.

Sales Offices and Warehouses: Baltimore • Birmingham • Boston • Buffalo • Chicago Cincinnati • Cleveland • Denver • Detroit • Houston • Los Angeles • New Orleans • New York City • Palmyra (N.Y.) • Philadelphia • Pittsburgh • Portland (Oregon) • Salt Lake City • San Francisco • St. Louis • Seattle • Spokane • Tulsa.

In Canada: The Garlock Packing Company of Canada Ltd., Toronto, Ont.

GARLOCK

PACKINGS, GASKETS, OIL SEALS,
MECHANICAL SEALS, RUBBER EXPANSION JOINTS

& Caster Co., Faribault, Minn.; vice president, D. B. Anderson, Nagel-Chase Mfg. Co., Chicago; and treasurer, O. T. Henkle, Mercury Mfg. Co., Chicago.

REPRESENTATIVES

Bellofram Corp., Waltham, Mass., appointed the following manufacturers' agents to handle its long-stroke diaphragms: Bumstead-Woolford Co., Seattle; James E. Dyer Co., Tulsa, Okla.; Esch & Associates Inc., Houston; William J. Gallagher Co., Philadelphia; John M. Meyer, Buffalo; Norman Engineering Co., Chicago; Schaal Associates Inc., Lexington, Mass.; Sentinel Products Co., Pittsburgh; Steel & Engineering Products Co., El Paso, Tex.; Western Controls Equipment Co., Sherman Oaks, Calif.; S. H. Isaacs Co., Cincinnati; and Clark Goodman Supply Co., Cleveland.

Childers Mfg. Co., Houston, appointed P. J. O'Meara Co., San Francisco, as sales and engineering representative for its aluminum weatherproof jacketing for insulated lines.

Electric Controller & Mfg. Co., Cleveland, appointed Promociones Industriales, S. A., Monterrey, Mexico, as sales representative. Electric Controller's Los Angeles office, under the direction of J. R. Woodruff, will service the state of Sonora in Mexico.

E. Horton & Son Co., Windsor Locks, Conn., appointed E. J. Somerville of Chicago as representative for its Horton Chuck Division in the state of Illinois.

Levco Corp., Pittsburgh, national distributors for Levinson Steel Co., that city, has made arrangements to carry a full line of Alcoa aluminum for immediate delivery in western Pennsylvania, eastern Ohio and northern West Virginia.

Reid Bros. Co. Inc., Beverly, Mass., appointed Starbuck Machine Tool Co., Seattle, as representative of its surface grinders to cover the state of Washington.

Which package is best for you?

ROEBLING HIGH CARBON WIRE is packaged in many ways... and for every kind of usage there's one particular type of packaging that will bring top handling and production efficiency... new economy in your plant. For certain wires, Roebling's new large-size reels or new disposable spoolless cores have special money-saving advantages:

The large reels are ideal for long runs. They reduce down time to a minimum.

The new spoolless core (a hollow fibre core without flanges) abolishes the storing and return of empty spools ... eliminates charges for spools and waiting for credits.

You *pay* for the best when you buy high carbon wire. Make sure you *get* it in wire and packaging. Specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING CF&I

Subsidiary of The Colorado Fuel and Iron Corporation

ATLANTA, 934 AVON AVE • BOSTON, 51 SLEEPER ST & 5 PITTSBURGH ST • CHICAGO, 5525 W. ROOSEVELT RD • CINCINNATI, 3253 FREDONIA AVE • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST • DETROIT, 915 FISHER BLDG • HOUSTON, 6216 NAVIGATION BLVD • LOS ANGELES, 5340 E. HARBOR ST • NEW YORK, 19 RECTOR ST • ODESSA, TEXAS, 1920 E. 2ND ST • PHILADELPHIA, 230 VINE ST • ROCHESTER, 1 FLINT ST • SAN FRANCISCO, 1740 17TH ST • SEATTLE, 900 1ST AVE S. • ST. LOUIS, 3001 DELMAR BLVD • TULSA, 321 N. CHEYENNE ST • EXPORT SALES OFFICE, TRENTON 2, N. J.

PHOTO BY MORANIS

NOW . . . a BROACHING MACHINE *for every shop!*

announcing

LAPOINTE 4 small sizes

BROACHING MACHINES

- LOW IN PRICE
- SMALL
- FAST
- ACCURATE

For the smaller shops and tool rooms, here's an all-purpose, universal broaching machine built with LAPOINTE precision — **for precision work.**

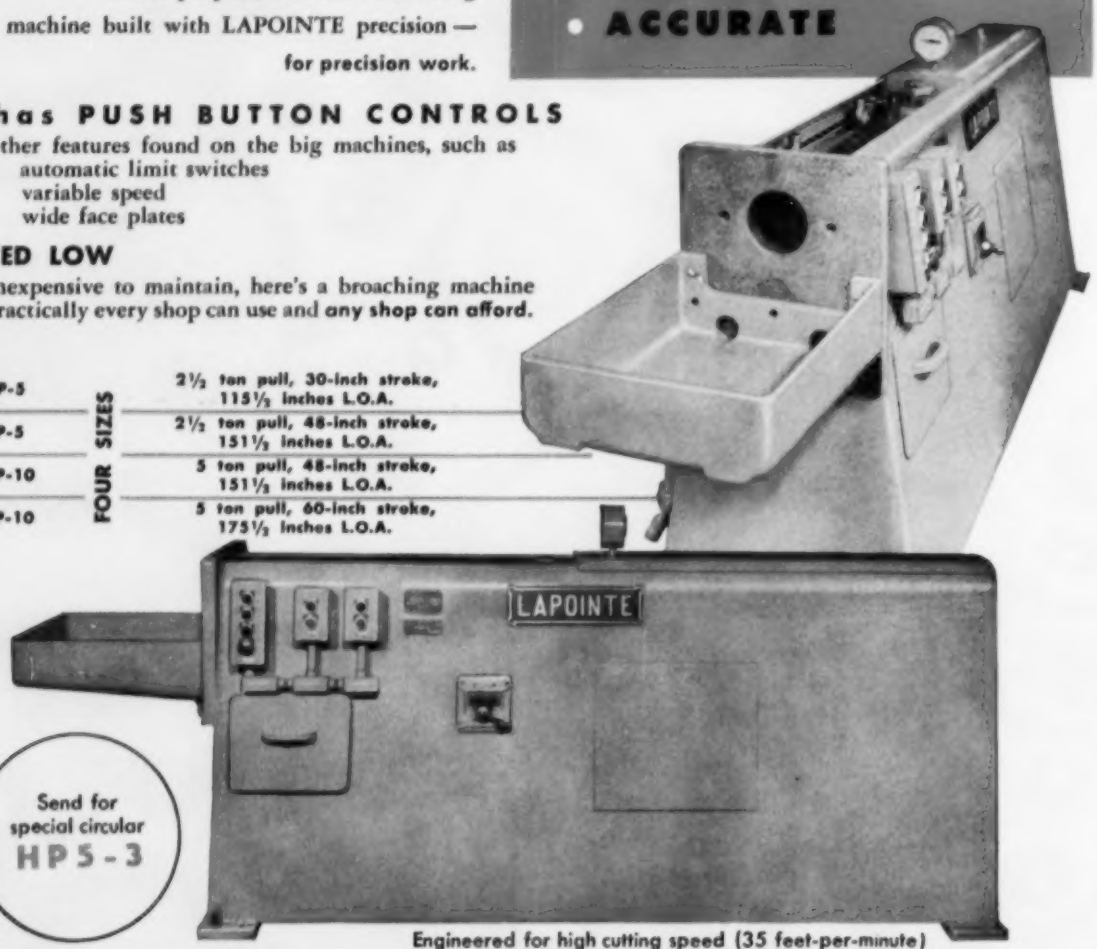
it has PUSH BUTTON CONTROLS

and other features found on the big machines, such as
automatic limit switches
variable speed
wide face plates

PRICED LOW

and inexpensive to maintain, here's a broaching machine that practically every shop can use and **any shop can afford.**

FOUR SIZES	
HP-5	2½ ton pull, 30-inch stroke, 115⅓ inches L.O.A.
HP-5	2½ ton pull, 48-inch stroke, 151⅓ inches L.O.A.
HP-10	5 ton pull, 48-inch stroke, 151⅓ inches L.O.A.
HP-10	5 ton pull, 60-inch stroke, 175⅓ inches L.O.A.



Send for special circular **HP5-3**

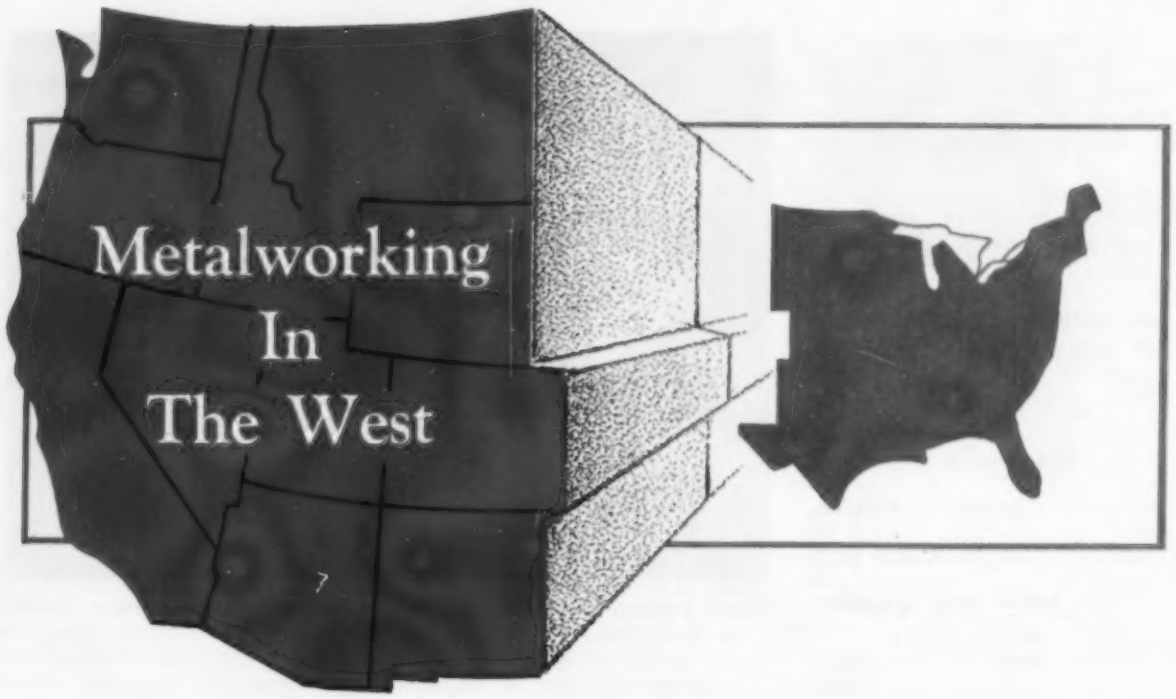
Engineered for high cutting speed (35 feet-per-minute) and high return speed (100 feet-per-minute) it's perfect for small work *where fast production with accuracy is essential!*

THE LAPOINTE MACHINE TOOL COMPANY

HUDSON, MASSACHUSETTS • U. S. A.

In England: Watford, Hertfordshire

THE WORLD'S OLDEST AND LARGEST MANUFACTURERS OF BROACHING MACHINES AND BROACHES



Doubled in the Last Decade

YOU CAN'T make the most of a booming market when you're 2000 miles away . . . that's why metalworking in the West has doubled in ten years.

And the same factors that created this growth are still at work expanding it. Rising population and rising freight rates, a tough combination to fight, are the big wedges pressuring manufacturers into westward moves. And local firms are springing up at a steady rate.

In California, for instance, nearly 5000 new residents arrive every week. And talking about freight rates, it costs the automobile companies nearly $3.40 per 100 lb to ship frames to West Coast plants.

How Big Now?—Take a closer look at the transportation equipment industry. This largest segment of western metalworking represents about half the metalworking employment. There are nearly 300 separate plants employing more than 20, and 30 of these have payrolls of over 1000 workers. The eleven western states now employ just about as many in metalworking as do the six New England states.

It's not all assembly work either. General Motors alone built 209,777 units in 1952 and spent an estimated $53.5 million with 1200 California firms for parts and services. Chrysler turned out over 100,000 units, spending $22 million with area suppliers. Ford made 127,000 units and bought a proportional volume of parts and services locally.

Since then, GM has constructed a Delco-Remy plant to supply itself with auto batteries, and Ford boosted its capacity by some 100,000 units with a new $50-million plant. Locally purchased parts for the two leaders now total over $150 million annually.

By Comparison—To the above figures add the aircraft industry with its $1 billion a year payroll, rail equipment and others and you get a better idea of the size of the transportation equipment industry. Big as it is, it adds up to only about 40 per cent of the dollar volume of western metalworking. Next biggest segment is primary metals production with 17 per cent, followed by non-electrical machinery with 16 per cent, and fabricated metal with 14 per cent.

Electrical machinery takes 8.5 per cent of the dollar volume, instruments and related products 2.5 per cent and ordnance and accessories 1 per cent.

Primary Metals—As metalworking plants grew in number demand for the metals also skyrocketed. In the last decade, steel production capacity in the eleven western states jumped from 4.9 million ingot tons to over 7 million tons. In spite of this record, some 40 per cent of the steel consumed still has to be shipped in from the east.

From a little over 200,000 tons production in 1945, aluminum output jumped to 485,000 tons last year or 33 per cent of the national total. The West still leads in copper production; and titanium, a newcomer, is approaching 3600 tons per year.

Rosy Future—When the ASTE and the Western Metals Congress gather in Los Angeles this month for exhibitions and technical meetings, they'll be acknowledging the importance of western metalworking and projecting its growth picture into the future.

Ten years ago economists cautioned that the West's bubble was due to pop when war industries dried up. They miscalculated the tenacity with which industry would cling to its wartime gains. Peace not only failed to stem the population influx, it spurred it on. And the rest is history . . .

A metalworking technique that made history with toothpaste tubes has grown in stature. It's flexing its muscles to tackle jobs like large gas cylinders

Impact extrusion vs. machining. Pile of cuttings indicates extrusion savings

Opportunity for Aluminum Impact Extrusions

By HERBERT HARVEY
Vice President
Harvey Aluminum
Torrance, Calif.

IT'S A VOLUME production part.

You now manufacture it by drawing, stamping, spinning, casting, turning or milling. Tomorrow you may be impact extruding it of aluminum.

Particularly if the part has a symmetrical design, impact extrusion would like to try its hand. Lugs, pads, flutings, serrations, ribs, recesses, flanges, no-draft walls and tapers have been added to its bag of tricks since its toothpaste tube beginnings.

Shapes—With impact extrusions, the design engineer can now achieve intricate shapes. By placing a boss in the die and using a hollow punch, a tube within a tube can be produced. A tube with a flange is possible by fitting the outside diameter of the punch very closely to the die.

By using inserts, an interesting combination of metals can be achieved. These inserts can take the form of a bushing located in a bore, a ring forming the outside of a flange, or a stud at the closed end of a tubular part.

The designer can specify an impact extrusion with a closed end and a flange at the open end, and can even call for a part having a tapered wall, produced by tapering the end of the punch. For instance, a channel or an angle can be tapered both in base and length thickness, and the length of the legs also can be tapered.

Complications—Decorative treatment to extrusion ends and walls is also possible, and as long as exterior ribs are fairly symmetrical, countless design variations are permissible. For example, in the base of a part, bosses, lugs, recesses, stems, pads, embossing or other projections can be incorporated; in the walls (inside, outside, or both) serrations, ribs, beads and flutes. Although many aluminum impact extrusions are round in cross-section, it is possible to fabricate square, rectangular, polygonal and other configurations.

Design requirements and the mechanical properties of aluminum impact extrusions are pretty much the same as those specified for forgings and continuous extrusions. One or more of the following features are common to most of them: Zero degree draft, close tolerances, approximate symmetry and a closed-end hollow section. Grain flow lines follow the contour of the finished shape, rendering it stronger than if machined from rod or bar. Impacts have the added feature of being able to use high-strength alloys from which improved properties are obtained by cold working.

Save Machining—For the majority of commercial applications, design engineers have found the surface of impact extrusions to be smooth and bright, requiring no grinding or finishing operations. The wrought structure readily accepts chemical, mechanical or electro-chemical surface finishes. Tolerances on intricately shaped impacts can be held closely, eliminating secondary machining. When machining is required, the draft-free surface makes checking easy.

Uses—At the present time,

AN IMPACT EXTRUSION (sometimes referred to as cold extrusion, cold forging, impact forging) is formed by placing a metal slug or disk in a die cavity and striking it a blow with a punch. The die cavity has the shape and dimensions of the outside of the finished part, and the punch has size and shape of the inside of the part. The impact is of sufficient intensity to cause the metal to squirt through the space between the punch and the die.

Here are the general types of impact extrusions:

Backward Extrusion, where the flow of metal is opposite to the direction of the punch movement.

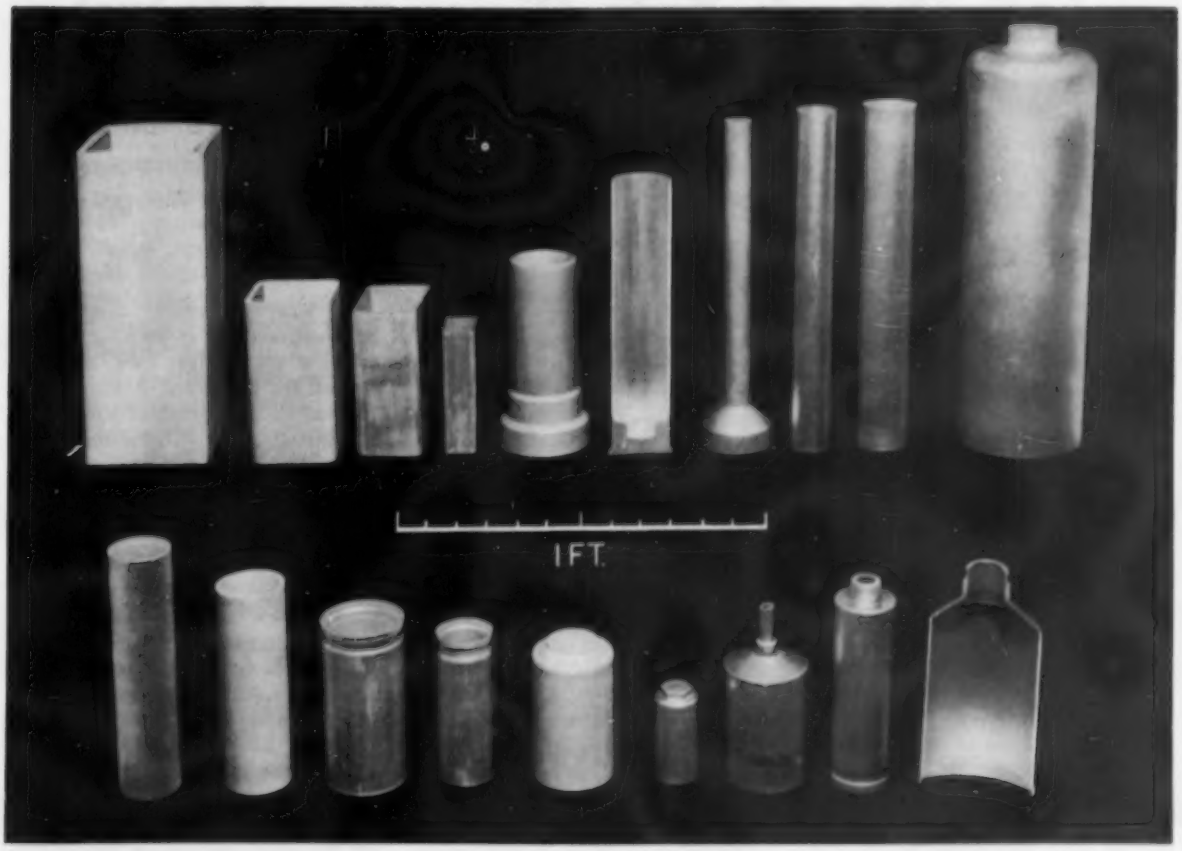
Forward Extrusion, where the flow of metal is in the same direction as the punch movement. A variation of the forward extrusion is the Hooker Process, where the flow of metal is caused by the punch pushing the slug in a forward direction, through an orifice in the die.

Opposed Extrusion, where the metal is forced to flow both with and opposite to the punch movement. A combination die incorporating the features of both backward and forward extrusion is required.

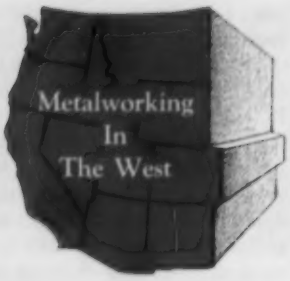
aluminum impact extrusions are found in electronic condensers and covers; containers for foods, liquids, cosmetics; airframe parts such as brackets, stiffeners, attachment fittings; brake and hydraulic pistons; ordnance components such as fuse parts and cartridge cases; builders' hardware; household appliances; lighting fixtures; business machines, and countless other applications.

But developments of new methods, techniques, and applications continue at a rapid pace. Presses of tomorrow will be able to produce impacts covering an area of 75 sq in. and larger. They will have greater length-diameter ratio, asymmetrical design, broader variations in thickness, improved dimensional tolerances and will utilize new higher-strength aluminum alloys. The wearing surface of aluminum impact extrusions will be improved to the point where it will equal that of steel.

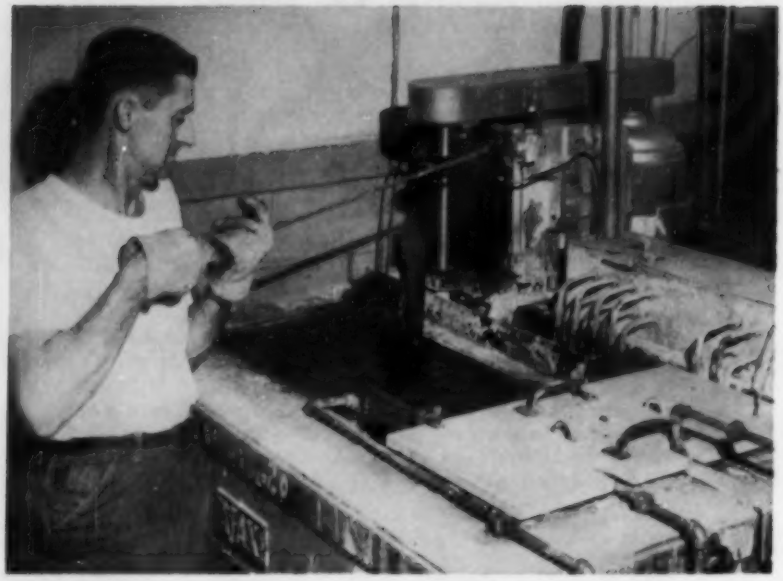
Coming—In the future, aluminum impacts will be recommended for large containers, boxes, tanks, cans, drums, gun barrels, rocket and guided missile bodies, ordnance components such as rocket fin assemblies, oil well equipment such as deep well pump parts, piston heads, housings, valve bodies, large compressed gas cylinders, motor housings, diesel pistons, fuel injection nozzles, electrical switch gear components, sprockets and gears.



Typical impact extrusions produced by Harvey Aluminum



By HARLAN GEARHART
Supervisor, Heat Treat Dept.
Clary Multiplier Corp.
San Gabriel, Calif



Operator lowers a die section into martemper bath as . . .

Salt Quench Aids Dimension Control

Punches and dies come out of heat treating almost the same size and shape as before. The secret is to martemper at a lower temperature than the steel's MS point

MARTEMPERING at about 50° below the MS point of the steel, we're controlling both distortion and growth in heat treated punches and dies.

With the system we're using, punches that have been sheared into a hardened die can be heat treated and returned to the toolroom where they will fit the die almost as well as they did before treatment.

Cycle—Parts, high manganese oil hardening tool steel, are first preheated at 1300° F for 20 minutes in a neutral salt bath. Next, they go into a neutral salt bath at 1440° F, where they remain for 40 minutes.

Quench takes place in a forced agitated sodium nitrite, sodium nitrate bath containing about 2 to 4 per cent water. This quench, which lasts for 10 minutes, is at 50° below the MS point of the steel. Parts are then cooled to room temperature in still air.

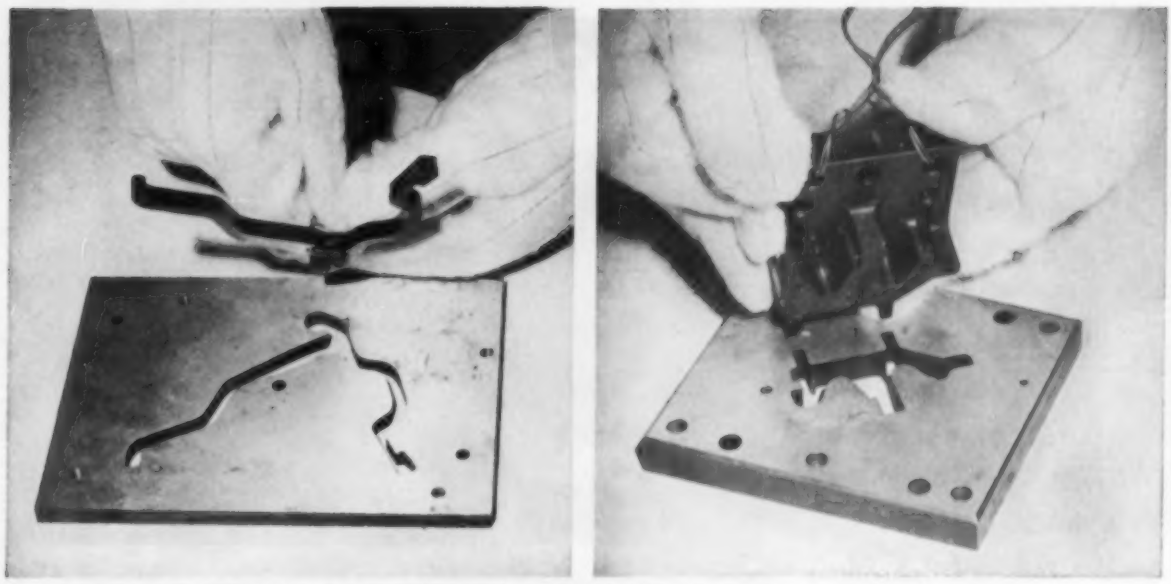
Departure—If the punch has a complicated shape, it can be placed in the mating die (heated to about 200° F) and the pair then cooled to room temperature. As the punch cools, transformation takes place, accompanied by expansion and hardening.

The expanding punch becomes wedged tightly in the die cavity. This controls distortion and expansion by almost 100 per cent. A 325° or 350° F temper of the mating punch and die shrinks the punch sufficiently to make easy removal of the punch from the die.

Switch—We went to martempering so we could control distortion and warpage which came with conventional oil quenching of the tool steels. First, we martempered for 10 minutes at 400° F (about the MS point of the steel).

Warpage and distortion were controlled but we found an intolerable amount of growth. In fact, we seemed to get at least double the amount of growth which we normally expected from oil quenching.

Tests—A series of experiments was laid out to determine the heat treat process that would give us the best over-all results. To test for growth, a number of blocks, roughly 2.5 x 4 x ½-in. were cut out of the same bar of tool steel. Four ¼-in. holes were jig bored in the blocks with a precise spacing, so we could check hole movements as well as over-all growth.



Just out of the martemper, these two punches are inserted into the dies. Both distortion and growth are minimal with this heat treat system

All samples were given the cycle mentioned for the punches and dies; that is a 1300° F preheat, then to 1440°, and the martempering at various temperatures, after which the parts cooled to room temperature in still air.

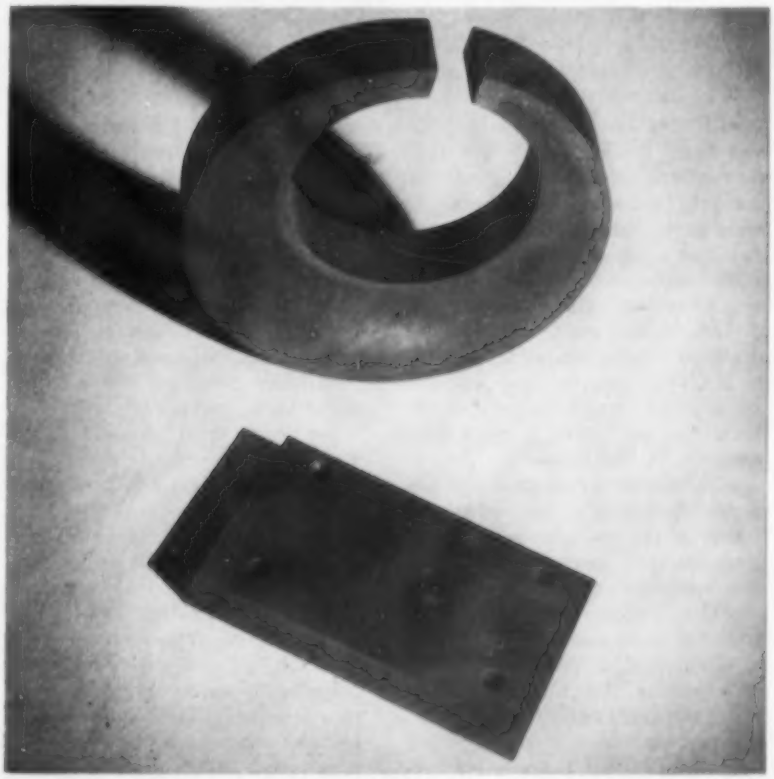
Growth was checked both after the quench and again after a 350 and a 400° F draw of two hours. Size change per inch length (0.00073-in. with an oil quench) were, for example, 0.00041-in. for a 400° F martemper, 0.00028-in. for a 350° F martemper. Growth and hole movement both were consistently lower with the 350° F martemper, even after the test sample had been drawn.

Distortion—Three C-rings were used to check the comparison of distortion caused by oil quench, martempering at 400° F, and martempering at 350° F. Here, martempering had the advantage—producing less than half the variation in the ring gap that was produced by oil quenching.

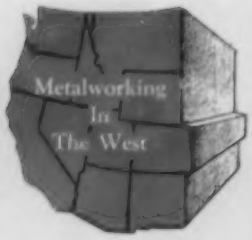
Free Change—To check actual volume change for martempering and oil quenching, two ½ x ½ x 1-in. samples were hardened and we checked the specific gravity. Data indicate actual volume change is greater in martempering.

This can probably be explained by saying that when martensite is forced to form under conditions of severe stress (which would happen when the sample is oil quenched and the outer shell hardened first) that it may occupy less space than it does when it forms under conditions that would make it relatively free of stress.

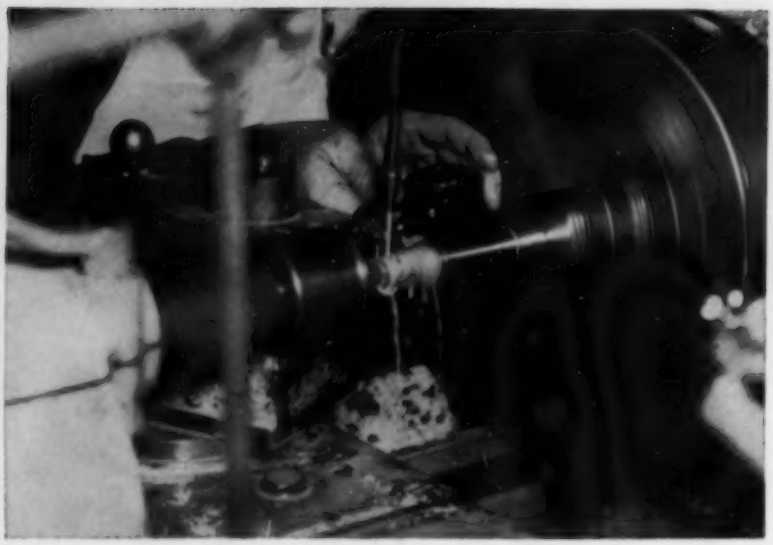
Regardless of the causes, we've found that considerably more benefits can be derived from semi-martempering at some 50° under the steel's MS point.



C-ring specimen (at top) and block were cut from tool steel and used for comparative tests. Data showed 350° martemper most advantageous



Continuing research at this West Coast plant is turning up practical recommendations for cutting the metal. Here are proved techniques for a variety of operations



Tips on Titanium Cutting

By FRED SPIEGL
Director of Titanium Research
Mars Engineering & Mfg. Co.
Los Angeles

TITANIUM and its alloys can be machined successfully. Granted, conventional methods may not do the job; but with the necessary know-how, you can cut the wonder metal on a paying basis.

The anticipated growth of the importance of this metal has led us into a long-range program of titanium fabrication at Mars. Still in its early stages, the program already has turned up some of the know-how we'll need to work with titanium in the future.

Slow Starter—Though recent experiments indicate that workhardening is not as serious as with stainless steel, cratering on top of the tool and galling are major problems. Tool wear is slow at first, but once a sizable wear land is established, it proceeds rapidly. This means the tool should be watched carefully and removed before work spoilage occurs.

Titanium's low thermal conductivity and the characteristically small tool-chip contact area help increase the tool tip temperature. Prevention of overheating is a basic factor in selecting and designing cutting tools, choosing cutting fluids and establishing techniques.

Variables—The selection and design of cutting tools is important. Carbide tools are best for steady cutting, but chip easily during intermittent cutting. Here, high speed tools, particularly with 7 to 8 per cent cobalt, should be used. The tool design should allow for a large chip contact for heat dissipation.

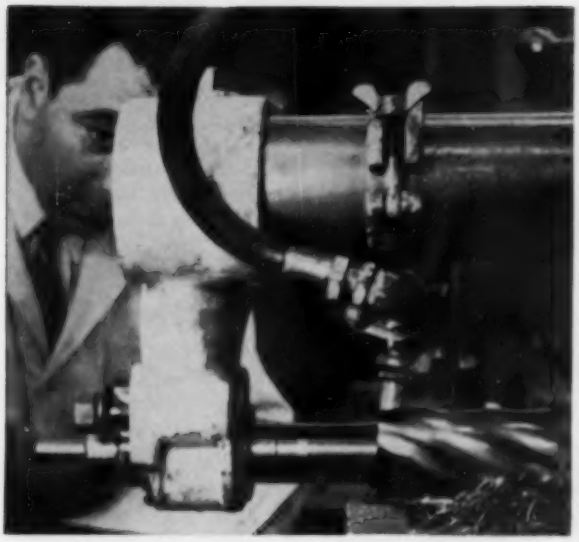
Water-base soluble oils and chemical cutting fluids are usually suitable. Oil-base lubricants are satisfactory although the danger of ignition should be considered in grinding. Soap-base materials mixed with water reduce the ignition problem. Carbon dioxide can be used when high cooling action is required. High pressure jets of special soluble oils show promise of improved cooling.

Heavy feeds and slow speeds will give optimum production with the least tool wear, since the cutting temperature is less affected by an increase of feed than speed.

Turning — Titanium cutting requires rugged machines and tools to eliminate tool chatter. They must be capable of maintaining uniform, positive cutting feeds and speeds.

For scale removal, such as encountered in alloy forgings, tough, heavy - duty roughing carbides should be selected. Stone the cutting edge periodically. The nose of the cutter must completely penetrate the scale. A large nose radius works best, although it may be reduced to 1/32-in. to eliminate chatter. Speeds should be about 50 sfpm with 0.010 to 0.020 in. feed and ⅛ to ¼-in. depth of cut.

For roughing without scale removal, general machining carbides provide fair tool life at 130 to 200 sfpm with 0.010 to 0.020 in. feed and ⅛ to ¼-in. cut. Effective



Climb milling works best on titanium. Carbide cutters do job, using high speed steel for intermittent cuts

White sparks, characteristic of titanium, show up in abrasive cutting. Coolants should be used

tool designs are 5 to 7° side rake, 0° back rake, 45° side cutting edge angle, 3° end cutting edge, 0 to 1/64-in. nose radius. Triangular inserts with ⅜ to ½-in. inscribed circles or ½-in. round inserts also perform well.

For finish turning, light roughing or finishing carbide grades give good tool life and surface finishes up to 300 sfpm. The above tool designs may be applied with feeds reduced to 0.005 to 0.020 in. per revolution with 1/64 to ⅛-in. depth of cut. High speed steel tools can be used at slower speeds.

Drilling—Sturdy, short power-fed drills give the best results. Drills for titanium should have larger point and helix angles than those for stainless steel. Oxide surface treatment or chrome plating reduces chip welding. High speed steel drills (5 per cent cobalt) appear to give longer tool life than the standard 18-4-1 grades. Heavy sulfur base oils and concentrated water soluble oils are satisfactory coolants.

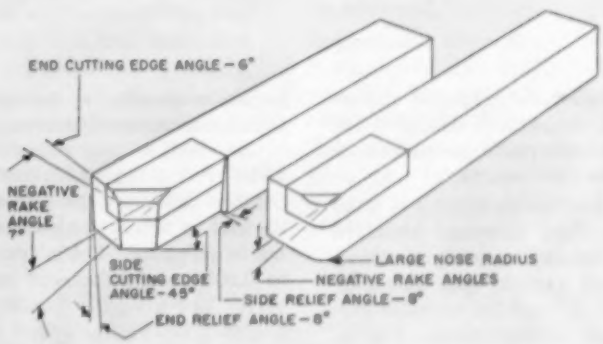
The glazing of workhardening effect of the initial cut makes the second more difficult. When drilling in two steps, a smaller-than-usual drill should be used initially. The principle of getting under the hard skin also applies to reaming. Chip removal is aided by sharp drills and by at least twice the normal clearance between the work and the drill bushing. Intermittent drilling may be necessary for deep holes. Use slow cutting speeds to start a drill in a hole that has been work hardened.

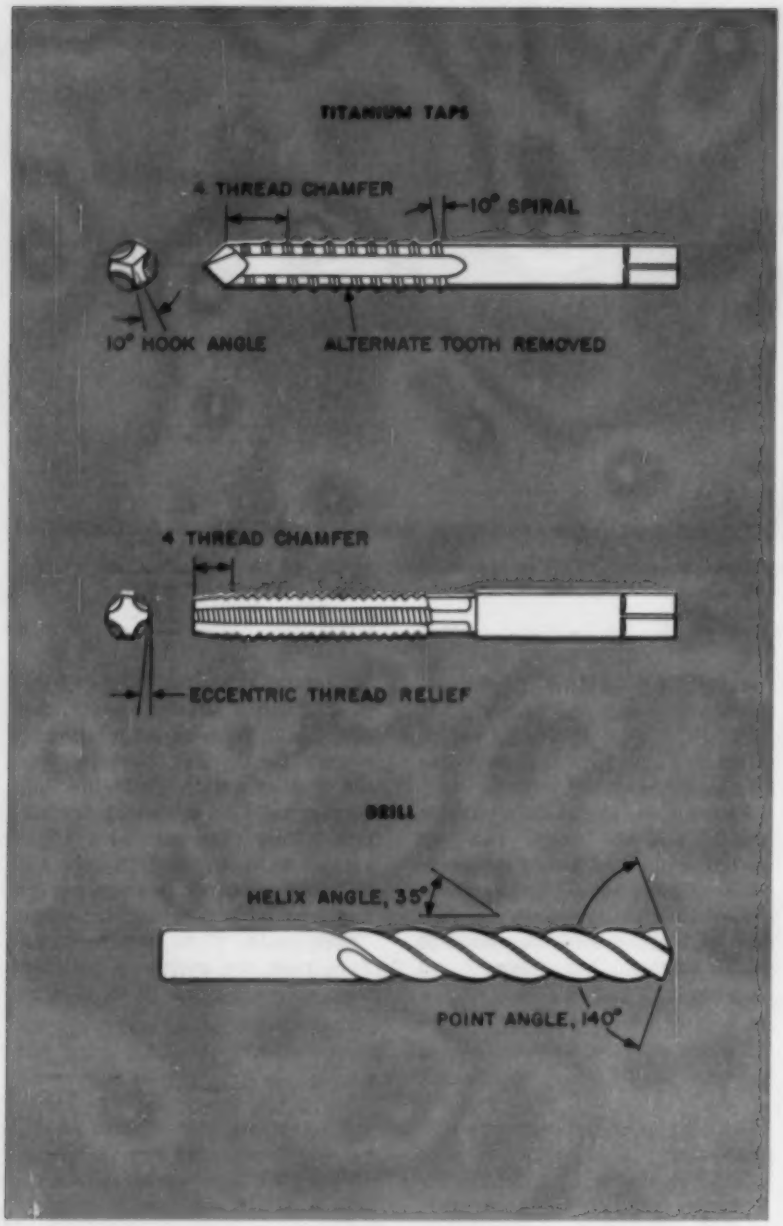
Reaming—Straight-flute carbide tipped reamers may run up to 100 sfpm for finishing operations. Slower speeds, in the vicinity of 15 sfpm, have to be used with high speed steel reamers. For good finishes, use spiral-fluted reamers.

Tapping—Tapping is one of the most difficult titanium machining operations. Pronounced galling and seizing tendencies interfere with the cutting action while the hole further exhibits shrinking tendencies. This combines with slight variations in the drilled hole size to cause tremendous pressures on the taps with resulting breakage.

Skip-tooth, three-spiral pointed-flute taps are relatively satisfactory. Speeds from 10 to 40 sfpm

TITANIUM TURNING TOOLS


END CUTTING EDGE ANGLE – 6°
NEGATIVE RAKE ANGLE 7°
SIDE CUTTING EDGE ANGLE – 45°
END RELIEF ANGLE – 8°
SIDE RELIEF ANGLE – 8°
NEGATIVE RAKE ANGLES
LARGE NOSE RADIUS



are recommended. Special sulfurized and chlorinated oils give excellent results, and some wax emulsions give fair results.

Milling—Though milling is more difficult than turning, standard milling techniques work on titanium. Both carbide and cast-alloy tools may be used but carbides permit higher cutting speeds. For intermittent cutting, high speed tool steels, such as the 18-4-2, may offer better results. Low tool efficiency is hard to cure because hardness usually is sacrificed to avoid excessive brittleness.

Use climb milling whenever possible. Power feeds help cutter life, but the tool must be retracted at the end of the cut to prevent flaking or chipping. Feeds from 0.003 to 0.008 in. per foot are satisfactory. Use 6 to 12° positive rake angles. Either sulfurized cutting oils or water base coolants work best on milling.

Broaching — Like tapping, broaching is a troublesome machining operation due to loading and galling tendencies. Use high speed tool steels with relief angles reduced to less than those for other ductile materials. Relatively slow speeds and rigid setups are musts. Each tooth should take a chip load from 0.002 to 0.005-in. and have a positive rake and full gullet so the chip will curl freely. Liquid CO_2 or sulfurized oils may be used for coolants.

Sawing—Standard circular sawing equipment will cut titanium, provided the blades are not permitted to ride and heavy pressures are applied. The similarity of sawing titanium and stainless steel is evident by the tendency of the surface to work harden. However, titanium is more apt to clog and wear the saw blade. Hydraulic feeds, upward cutter rotation, and star-wheel chip removers are recommended.

Friction sawing is satisfactory, though present methods give low blade efficiencies and poor accuracy. Slower cutting speeds (in the vicinity of 9000 fpm), heavy feeds and adequate coolants are necessary.

Power hack-sawing is a satisfactory method of cutting titanium. Use coarse, sharp blades, strong supports, heavy positive feeds. Plenty of standard cutting oils, preferably with sulphur of chlorine additives, will cool the work adequately and also will remove the chips.

In band sawing, the blade tends to wander, seize and generate excessive heat. This means rapid tool wear, short life. Slow speeds and hydraulic feeds work best. Special alloy blades and machines designed to hold the blade rigid may be instrumental in obtaining better results. Band sawing at this time seems practical only for thin sections.

Abrasive Cutting—Present procedures do not adequately prevent overheating and galling, but generally do provide an efficient production method. Stress relieving after cutting may be necessary. Slower wheel speeds than those for steel are recommended. Oscillating and plunging motions of the grinding wheel and rotation of the bar stock itself will reduce overheating. Good lubricants are essential.

"WOW! what happened to our labor cost on this run?"

How many times—and how recently—have you asked this question? It's a good one, with a lot of possible answers. The important thing is, can these skyrocketing costs happen again, or have the causes been corrected? Often the answer is very simple—and easily remedied.

Could this be your answer?

A batch of castings or forgings with cracks that nobody found until costly hours had been wasted machining and finishing them . . . a heat treat that went sour . . . improper grinding, handling, cleaning, all are possibilities, and all can vary from run to run.

Cracks, whatever the cause, run up your labor costs if you don't find them *early* enough. Early enough to find and correct the cause before parts are run and finished in quantity, only to be scrapped.

Inspection is low cost with Magnaflux' Methods and it finds all cracks... helps you find the cure. It can save you many times its trifling cost.

Ask to have a Magnaflux engineer give you facts and figures—or write for new booklet on LOWER MANUFACTURING COST.

MAGNAFLUX

MAGNAFLUX CORPORATION
7312 West Lawrence Avenue • Chicago 31, Illinois
New York 36 • Pittsburgh 36 • Cleveland 15
Detroit 11 • Dallas 19 Los Angeles 58

This Is Kaiser Steel

The war got it started, but peacetime growth of the West is what made it . . .

A Giant in One Generation

FROM a war-time stepchild to a respected member of the steelmaking family. That's what Kaiser Steel Corp. achieved in the record time of 13 years.

But it's not so amazing when you consider the ingredients that went into the finished product. Take one energetic promoter and organizer, add a capable staff, stir in the richness of a fabulously growing West Coast market and you're bound to come up with something good. That something "good" is the highly versatile Fontana Works, that mushroomed from a $90-million plant in 1943 to a $250-million integrated operation.

How it Grew—It wasn't accomplished without the usual growing pains and a few unusual ones, too. First came the job of convincing Washington that the idea of an integrated mill on the West Coast was sound, and that it could be completed in time to help the war effort. That done, and with a loan of 60-million RFC dollars in their pockets to start with, ground was broken at Fontana, Calif., 45 miles east of Los Angeles in the San Bernardino valley.

Because eastern steel mills were busy maintaining their maximum tonnage outputs, Kaiser found itself building a mill with a minimum of engineering and construction personnel. Despite this handicap, the 1200-ton blast furnace was blown in Dec. 30, 1942, with in many instances, the people who built it staying on as operators. For some, it was the first blast furnace they had ever seen. Four 185-ton open hearths and a 110-in. plate mill were included in the original contract, too.

Round Two—Even before the first iron was cast, the War Production Board granted an additional $26 million for plant expansion. Two more open hearths, a 28-in. structural mill served by a 36-in. breakdown mill, a merchant bar mill and alloy finishing facilities were contracted. With the six open hearths Kaiser could utilize all of the hot metal from the blast furnace in turning out 675,000 tons of ingots annually.

These are the facilities that rolled out ship plate (for Kaiser's own shipyards), structurals and some merchant shapes before the war ended in 1945. Then came the days of decision. Obviously, a plant set up to produce mostly ship plate had to look for new markets now that shipyards were closing down. Then, too, there was the question of how to repay the RFC loans.

First Things—The switch to civilian production wasn't too difficult. The expanding oil and gas

. . . The only fully integrated steel mill on the West Coast

. . . Fontana mill occupies 1800 acres, employs 6300 people. Including mines, home office and sales offices, total payroll is more than $38 million

. . . Original plant cost $90 million in 1941; it's worth $250 million now

These Are the Tools

. . . Three blast furnaces, 1,314,000 tons

. . . Nine open hearths, 1,550,000 tons

. . . 225 coke ovens, 1,006,000 tons

. . . Nine rolling mills

48-in. blooming mill

110-in. plate mill

86-in., six-stand hot strip mill

44-in. tinplate mill

Continuous weld pipe mill

Electric weld pipe mill

Merchant skelp mill

Cold reversing mill

These Are the Products

. . . Structural shapes, plates, sheets, strip, skelp and bars

. . . Cold rolled strip, electrolytic and hot dipped tin and terne plate

. . . Buttweld and electricweld pipe and tubing

. . . Galvanized pipe

. . . Black plate

. . . Iron molds and stools

WILLIAMS-WHITE HYDRAULIC and MECHANICAL PRESSES

for Every Forming, Forging, Bending Job

5484
250-TON HYDRAULIC
A-FRAME PRESS
Stroke, 30"; Daylight, 45";
Bed, 42" x 36"

5485
S-1-250 42" x 36" TIE ROD PRESS
Stroke, 6"; Daylight, 24"; Bed,
42" x 36"; Capacity, 250 tons

Building Quality Machinery since 1854 has provided WILLIAMS-WHITE & CO. a wealth of experience in the design and construction of Hydraulic and Mechanical Presses.

This experience is evident in low initial cost, simple design, sturdy construction and long, trouble-free life. Many WILLIAMS-WHITE Presses, Punches, Bulldozers, Shears, Hammers, Rolls, etc., have been in use since before the turn of the century.

The on a WILLIAMS-WHITE Machine is your assurance of Quality, the result of over 100 years experience in building production machinery.

Features:

- Low Initial Cost
- Simple Design
- Sturdy Construction
- Long, Trouble-Free Service

REPRESENTATIVES:

CHARLES F. RYMAN
Pittsburgh, Pa.
A. L. BECHTEL & SON
Cleveland, Ohio
IRVING R. GARD & CO.
Seattle, Wash.
WILLIAMS-WHITE & CO.
Chicago Office:
J. E. Maynard, Mgr.
53 W. Jackson Blvd.
GEORGE M. MERIWETHER
Birmingham, Ala.
SHELDON O. HENDERIKSON
Minneapolis, Minn.
ALLIED NORTHWEST
MACHINE TOOL CORP.
Portland, Ore.
E. E. WOOD MACHINERY CO.
Detroit, Mich.
PAGEL MACHINERY CO.
Milwaukee, Wis.
SEIFREAT-ELSTAD M'CH'Y CO.
Cincinnati, Columbus and
Dayton, Ohio
EDWARD A. LYNCH M'CH'Y CO.
Wynnewood, Pa. (Phila.)
GEORGE A. DAVIES, Jr.
M'CH'Y CO.
Los Angeles, Calif.

For details, write any of our representatives above, or direct to WILLIAMS-WHITE & CO.

BUILDERS OF MACHINERY SINCE 1854

WILLIAMS-WHITE & Co.

300 EIGHTH ST. • MOLINE, ILLINOIS • EST. 1854

Finished steel products are what the West needs, so this 86-in. hot strip mill is one of the key production pieces

Western markets for pipe and tubular products keep both this continuous buttweld and the electricweld mill busy

industry, civilian and commercial construction and growth in general proved a good market for plate and structurals. What was needed now was a tube mill, so into the 16-stand merchant mill, installed in 1945, went changes.

Mill now consists of four 21-in. stands, eight 18-in. stands, two 14-in. stands and three vertical edgers. Only the first ten stands are used in rolling skelp, which is made into butt welded pipe ½ to 4 in. in diameter at speeds up to 520 fpm.

More Expansion—Other things were happening in that period between 1945 and 1950. A cold reduction department was added to take advantage of the growing demand for cold rolled sheets. This four-high reversing mill has a 5500-ton-per-month capacity in coils up to 16⅜-in. wide.

To help it chart its future course, Kaiser then made an extensive survey of the western steel market. The report showed a decided production deficit in sheets, tin plate, cold strip and continuous-welded pipe. With a rosy future in sight, but with a $90-million debt still owed the RFC, a $125-million private financing program was successfully launched. The money wiped the slate clean with RFC, paying back $1.23 for every dollar loaned. This left enough working capital to embark on the development program that almost doubled the plant in the last five years.

More Ingot Tonnage—Since a seventh open hearth furnace went into production in late 1948, the shortage of hot metal had to be cleared up first. A second 1200-ton blast furnace and an additional bank of 45 coke ovens took care of that imbalance.

Then came 1951 and a certificate of necessity for another $22.6 million of expansion. Again, privately-financed money built a four-stand 86-in. hot strip mill, the electric-weld pipe mill, an electrolytic tin line with a 130,000-ton capacity and the eighth open hearth furnace. Finishing capacity was now ahead of production, but only temporarily.

Hardly had the first heat been tapped in No. 8 open hearth when plans for No. 9 were announced. And to bring pig iron production back into balance, with some additional tonnage to sell to western foundries, the third blast furnace also began to take shape in 1952. Ninety more coke ovens were contracted at the same time. Two more finishing stands were installed on the 86-in. hot strip mill.

What's Next—Having grown in well-ordered steps, there was no

Jack L. Ashby, Vice President and General Manager, Kaiser Steel Corporation

Outlook for Steelmaking in the West

To assess the prospects for the continued expansion of the steel industry in the West, it is necessary to consider two factors: (1) Population growth in the West, expected to grow from the present 20 million (seven Western States) to about 25 million by 1965, and (2) the increase in the West, as well as the rest of the nation, in total output of goods and services per capita.

Consumption of finished steel products should be about six million tons this year. If steel consumption increases at the same rate as projected for the total output of goods and services, the consumption rate by 1965 should reach eight million tons.

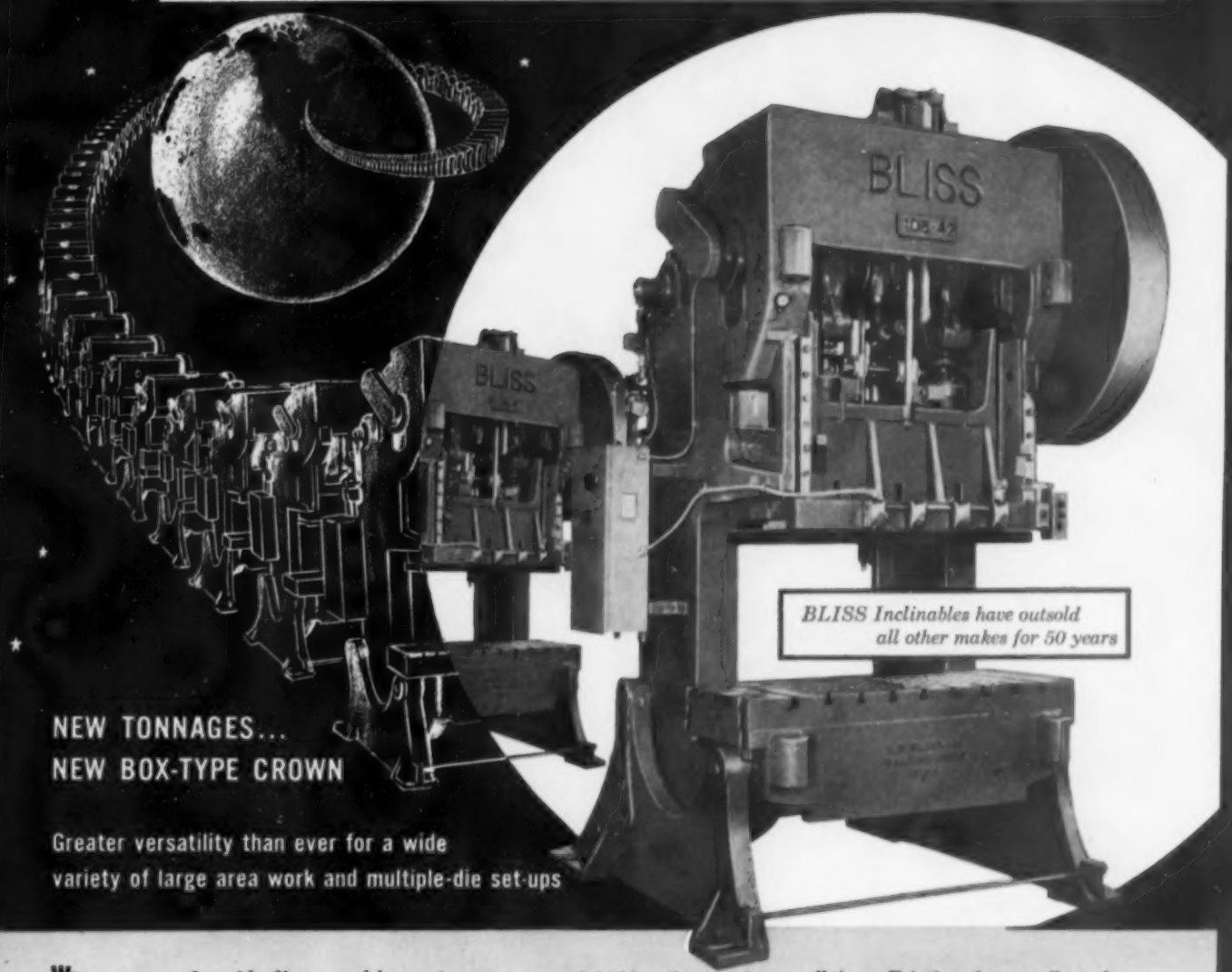
While the West has depended on Eastern sources for a portion of its steel supply, and no doubt will continue to do so, it is perfectly reasonable for Western steel mills to have as their minimum goal the production of the entire two million ton increase.

To produce these two million tons of finished steel products would require an increase in ingot steel capacity of three million tons annually. Only two million ingot tons were added in the last decade, a period considered to be of almost phenomenal growth.

Thus, Western steel mills must grow more in the next ten years than they have in the last, just to keep pace with the growth of the West. To capture a greater share of the Western market, even more basic capacity would have to be added. **Jack L. Ashby,** Vice President and General Manager, Kaiser Steel Corporation.

• • • • • • • INTRODUCING BLISS' NEW

DOUBLE-CRANK INCLINABLE SERIES



BLISS Inclinables have outsold all other makes for 50 years

NEW TONNAGES...
NEW BOX-TYPE CROWN

Greater versatility than ever for a wide variety of large area work and multiple-die set-ups

When you need a wide die area, this is the press to handle tough blanking, forming, drawing, perforating.

Add a Bliss pneumatic cushion (the press is set up to receive it) and you extend the range of *draw* work.

For high production work, the addition of a Bliss feed (single or double roll, dial) will give you runs of 200 or more strokes per minute.

Improvements Add New Standards of Accuracy

- *New, Heavy Box-Type Crown*—the same as is used on rugged Bliss automotive presses—adds mass, rigidity ...minimizes deflection. Gives 100% up-snug bearing support. Adds strength through entire cast Meehanite gap frame. Keeps slide in perfect alignment even under unusual off-center loads.
- *Air Friction Clutch and Brake*—cool-running. Automatically adjusts for wear, making for fast action between full brake and engagement at all times. Friction plates easily replaceable without tearing down clutch.
- *Other Features*—Precision gibbing, roller bearings, extra-heavy ball-seat connections, heavy-duty forged shaft.
- *All Parts Available from Stock*—Parts are interchangeable and available from stock through any Bliss sales office.
- *Reasonably Priced*—Only Bliss offers a standard double-crank inclinable (to 161 tons) and with it offers the same low cost value as all Bliss Inclinables. Write for catalog and information about our Deferred Payment Plan.

E. W. BLISS COMPANY, CANTON, OHIO

BLISS
SINCE 1857

is more than a name...it's a guarantee

SEE FOR YOURSELF

where FARREL GEAR UNITS get their CAPACITY FOR WORK

As you can see, the full face width of each gear in a Farrel speed reducer is at work, transmitting power.

Instead of a center groove, Farrel gears have a *backbone* formed where the helices meet. This *backbone* provides extra strength, and greater load-carrying and shock capacity — especially important in tough-job applications.

What you can't see, but which is equally important, is that these gears have teeth generated by the famous Farrel-Sykes method—assuring accuracy of tooth spacing, profile and helix angle. This accuracy pays off in smooth, quiet, uniform power flow.

Farrel speed reducers are made in a number of types, with a wide range of ratios and capacities. For more about these long-lived units ask for a copy of bulletin 449.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N.Y.
Sales Offices: Ansonia, Buffalo, New York, Boston, Akron, Detroit, Chicago, Memphis, Minneapolis, Fayetteville (N. C.), Los Angeles, Salt Lake City, Tulsa, Houston, New Orleans

FB-991

Farrel-Birmingham®

reason to believe that the Fontana works was through expanding. Sure enough, in 1953 another $8 million was spent, this time to boost electrolytic tinning capacity to 200,000 tons per year. A third slab heating furnace and a new slab conditioning yard, plus modification of the blooming mill to take 48-in. widths, were also in that expenditure.

Nothing has been said yet, but it doesn't take shrewd observation to guess what a couple of the next moves might be. For one thing, slabs for the hot strip mill now have to be roughed in the two plate mill stands. And if rolling schedules ever demand it, there's room for another mill in the ingot breakdown line.

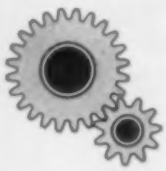
Raw Materials—Not wanting to get caught in the position of having an outside source for vital iron ore, Kaiser acquired the extensive Eagle Mountain deposits in 1944. Located only 163 miles from Fontana, production is about 2 million tons per year and proved reserves will last more than 25 years. Ore averages 51 per cent iron, but beneficiation brings the shipped ore up to 56 per cent.

Most of the coking coal comes from the company's mine in Sunnyside, Utah. Purchased in 1950, this property is considered one of the most completely mechanized mines in the country. Average production is 1.6 million tons annually, and reserves are sufficient for another 70 years of operation.

Limestone comes from sources near Las Vegas, Nev. Kaiser does not own this property, but here again there is an assured supply.

The Payoff—There can be no doubt now as to the wisdom of Kaiser's steelmaking venture. Last year when the rest of the industry operated at a 71 per cent average, Fontana turned out steel at an 84 per cent clip. Sales were $112 million, even under the highly competitive conditions.

With their production machinery tailored to the specific needs of the West, Kaiser looks forward to sales ahead of the industry average again this year. And having already demonstrated its ability to grow with its market, you can bet that Kaiser will be ready for the next wave of expansion.



MACHINE TOPICS

By R. F. HUBER, *Machine Tool Editor*

NEW ORDERS for machine tools in February should equal those of January. At that rate, even if March doesn't hold up, the first quarter of 1955 will finish strong, certainly above the first quarter of last year, but still off from the first quarter of record-breaking 1953. Recovery in this bellwether industry is a sign that users expect good business for some time to come.

January's new-order figure has been released by the National Machine Tool Builders' Association. As forecast (STEEL, Feb. 7, p. 59), it topped that of December of last year—203.6 to 202.9 (1945-1947 equals 100).

Evidence that the industry turned a corner in these two months shows up in the other fourth-quarter figures of last year—148.9 and 119.5. High for the year was June, with 185.2.

Spread—All machine tool builders contacted by STEEL a week ago indicated their January sales levels had continued through February. Most new business is made up of small orders for one or two machines, coming from nearly every customer industry on the books.

That's the kind of business builders love. It can be a nervous prosperity when sales are geared directly to a handful of large plants with multimillion dollar buying programs.

Reason—Most builders feel the general rise (some prefer to call it recovery) in business is due simply to restored confidence of their customers in their own future. Much of it certainly is due to the need to slash production costs to compete in today's market.

There's no evidence to show that the relaxing of depreciation allowances on capital goods has had any direct effect on machine tool sales. Best bet is that it'll be evident only in the long pull.

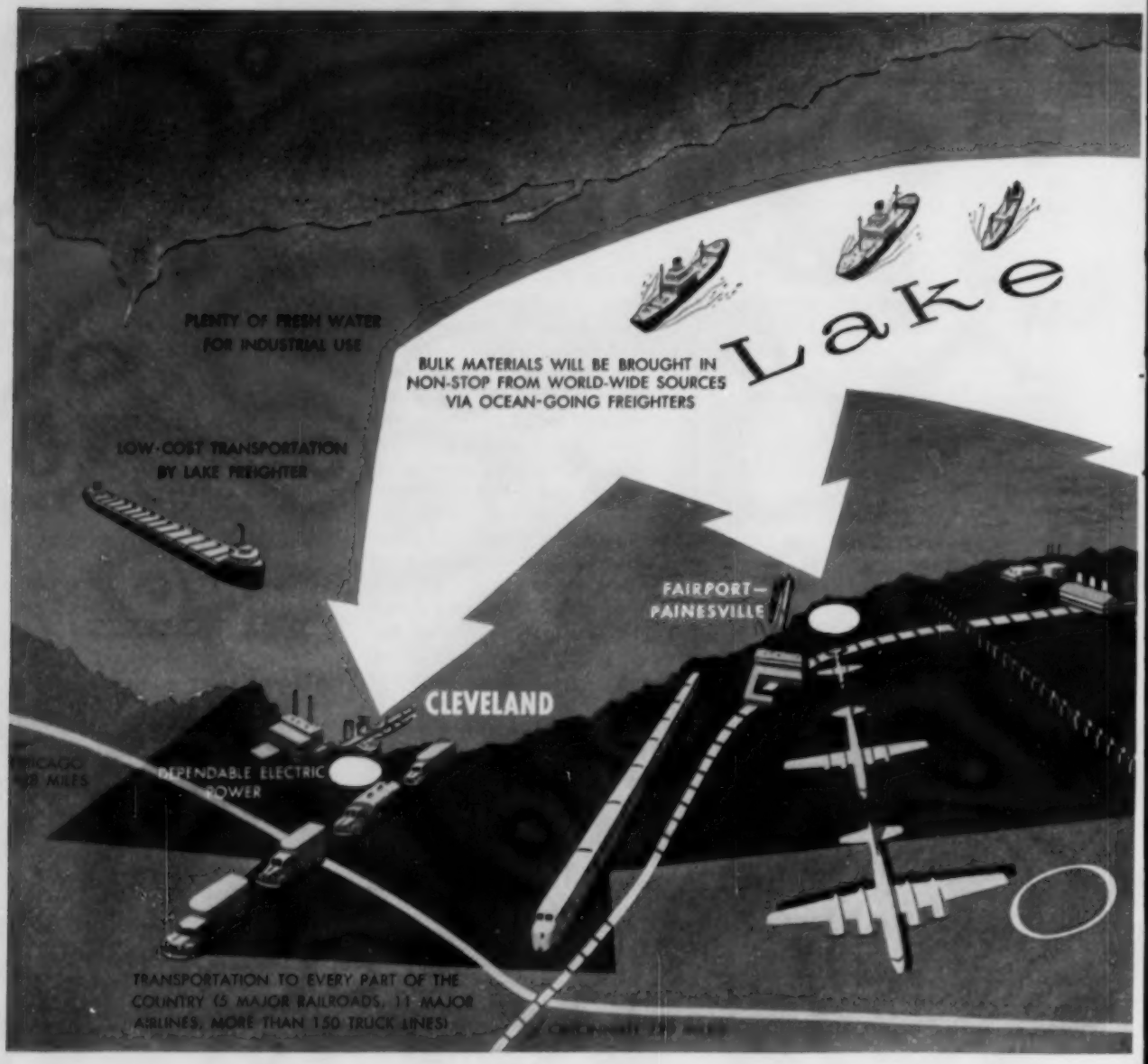
Future—With the industry off to a good start in 1955, what's the outlook for the rest of the year?

Although the industry is not tied to the ledgers of any one customer group, machine tool builders, like most businessmen, are keeping a close watch on automobile producers.

The current high level of auto output may well be cut back during the second half of the year. Also, there's still the outside chance of a strike. In either case, builders feel the pace of new tool orders will reflect somewhat the pace in auto production this year.

Their Year—To offset a possible drop, though, the machine tool show in Chicago next fall is bound to create interest in machine tools. More important, the show is engendering brand new, vastly improved machines that will be introduced during the next six months. They certainly will be a sales stimulant.

Then, too, the Government has promised that 1955 will see several large machine tool buying programs come out of Washington. Total up all the variables and 1955 should equal a satisfactory 1954.


PLENTY OF FRESH WATER FOR INDUSTRIAL USE
BULK MATERIALS WILL BE BROUGHT IN NON-STOP FROM WORLD-WIDE SOURCES VIA OCEAN-GOING FREIGHTERS
Lake
LOW-COST TRANSPORTATION BY LAKE FREIGHTER
FAIRPORT—PAINESVILLE
CLEVELAND
DEPENDABLE ELECTRIC POWER
TRANSPORTATION TO EVERY PART OF THE COUNTRY (5 MAJOR RAILROADS, 11 MAJOR AIRLINES, MORE THAN 150 TRUCK LINES)

St. Lawrence Seaway makes possible... opportunities never before

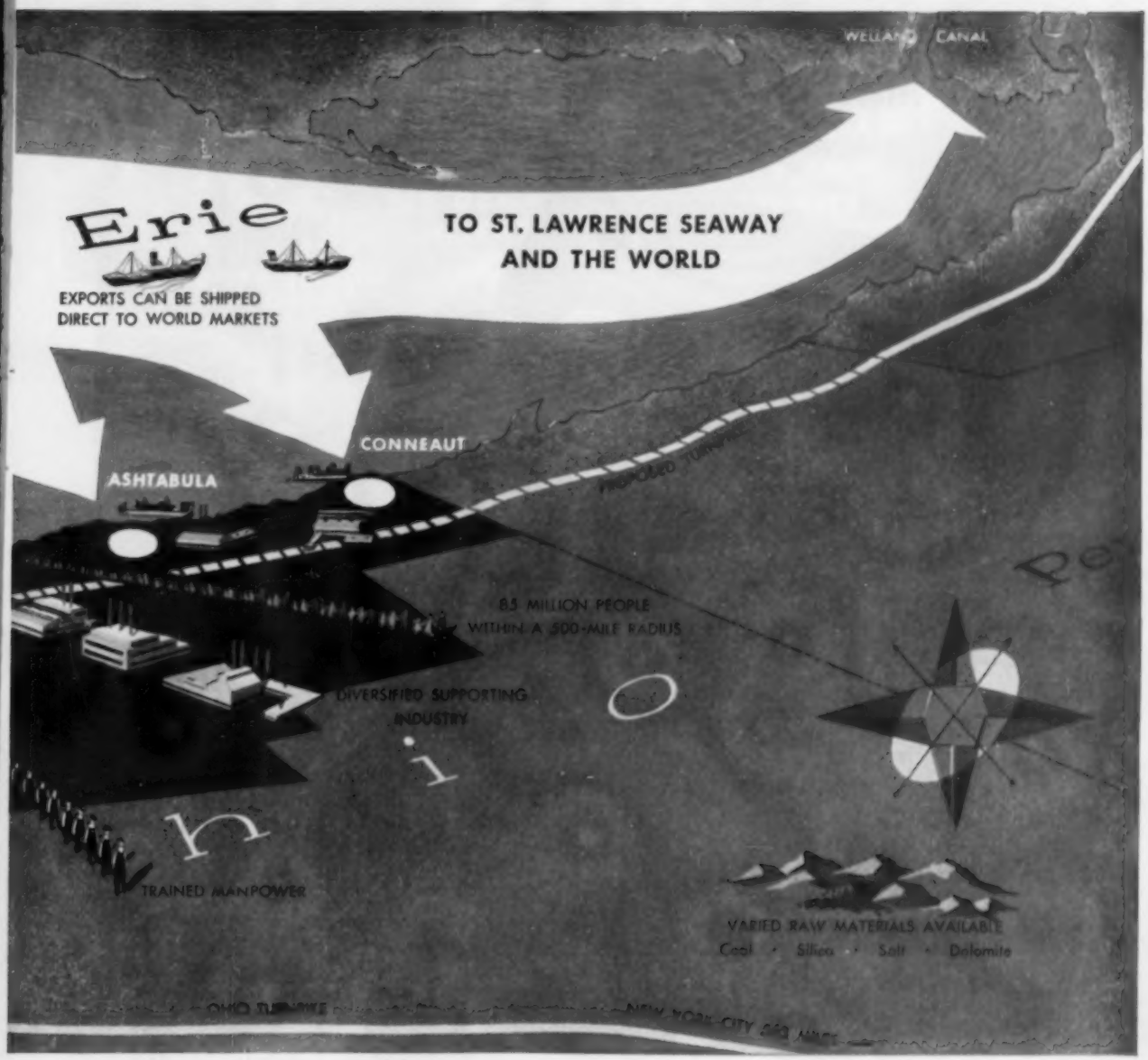
THE BEST LOCATION IN THE NATION IS NOW BETTER THAN EVER!

With the St. Lawrence Seaway, a long-time dream of industry is now about to come true. For the first time in history, industry will be able to have the advantages of a "*heartland*" location—in the midst of the nation's greatest markets and resources—combined with low-cost ocean shipping to or from anywhere in the world!

This new frontier of opportunity is shown in the map above.

Within a 500-mile radius of this Northeast Ohio area are over half the people in the country—eleven of America's fifteen largest cities. At hand, or within a short haul, are most of the basic materials of industry . . . fresh water, coal, iron, salt, limestone, and many others. Even without the Seaway, the advantages of "the best location in the nation" are so great that two billion dollars have been invested here in industrial expansion since 1944.

With the Seaway, its advantages will be even greater. Bulk



in Northeast Ohio... plant-location equalled in America

materials can be brought in directly by ocean freighter at minimum cost. Manganese, phosphates, and other raw materials for the first time can be economically processed in the midst of the markets where the finished product is consumed. And heavy machinery can be exported to world markets at lower cost. With the Seaway scheduled for completion in five years, the time to plan for a plant location along Ohio's "Seaway Shore" is during this coming year. We will be glad to help you do it.

NEW FILM SHOWS ADVANTAGES OF PLANT SITE ON OHIO'S "SEAWAY SHORE".

A factual, 28-minute sound movie in color. To arrange a showing for your key people or industry group, write in confidence on company letterhead to R. L. DeChant, Manager, Development Department, The Cleveland Electric Illuminating Company, 87 Public Square, Cleveland, Ohio.

The Cleveland Electric Illuminating Company

PEARLITIC MALLEABLE CASTINGS

when operating conditions . . .

. . . are severe

If service conditions are unusually rugged and you're troubled by high manufacturing costs—look to pearlitic malleable castings!

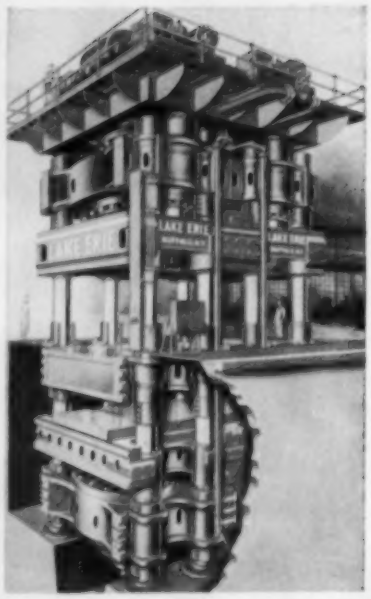
Pearlitic malleable has high fluidity that casts easily into complicated shapes. It resists wear under heavy loads at high speeds . . . has high ultimate strength . . . possesses excellent non-seizing properties for bearing surfaces . . . can be given a very smooth finish where desired . . . and can be either liquid quenched or air quenched. And perhaps *most important of all, pearlitic malleable machinability index ranges from 80 to 90* (B1112 steel = 100).

So look your product over critically. Then check pearlitic malleable castings. They can replace more expensive methods of fabrication or manufacture . . . can lead to reduced weight, less machining time . . . fewer assembly operations . . . *greater sales appeal for your product.* AA-108

NATIONAL MALLEABLE AND STEEL CASTINGS

COMPANY
Cleveland 6, Ohio

The Nation's largest independent producer of malleable and pearlitic malleable



Combined 10,000-ton pressure puts this press . . .

Ahead in Stretch

VERSATILITY describes the 10,000-ton, hydraulic press recently delivered to McDonnell Aircraft Corp., St. Louis.

To be used for stretch forming, it has two 5000-ton, self-contained units which can be operated individually or simultaneously. Of column-type design, each of the two units is a single action press with a 4500-ton cushion.

Dual Role—A clamping arrangement between the separate draw platens permits conversion from 5000-ton individual to 10,000-ton dual operation. An identical arrangement between the cushion platens permits conversion from 4500-ton individual to 9000-ton combined operation.

Each draw ram stroke is 60 in.; cushion ram stroke is 30 in. Cushion pads measure 102 x 138 in. Over-all height of the press is 52 ft and the combined weight is 1600 tons. Closing speed is 425 in. per minute; pressing speed is 20.5 in. per minute.

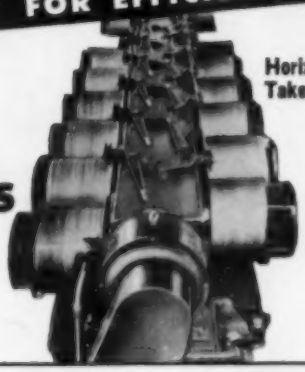
Built by Lake Erie Engineering Corp., Buffalo, the press was designed so additions can be made at either or both ends to result ultimately in an aggregate pressing tonnage of 20,000.

Vaughn

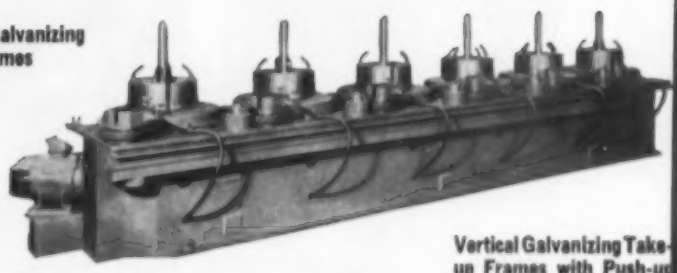
AUXILIARY EQUIPMENT

CORRECTLY DESIGNED—STURDILY BUILT
FOR EFFICIENT WIRE MILL SERVICE

TAKE-UP FRAMES

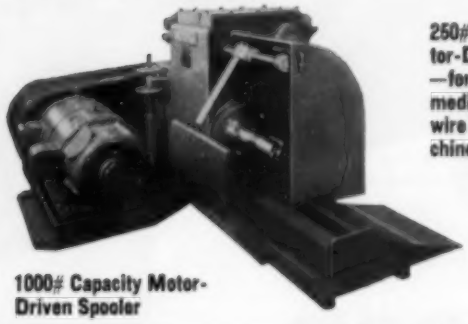


Horizontal Galvanizing Take-up Frames



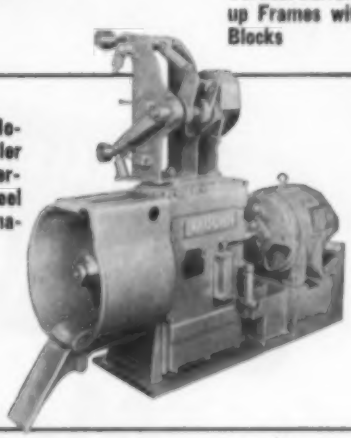
Vertical Galvanizing Take-up Frames with Push-up Blocks

SPOOLERS



1000# Capacity Motor-Driven Spooler

250# Capacity Motor-Driven Spooler —for use with intermediate or fine steel wire drawing machines



POINTERS and DIE STRINGERS

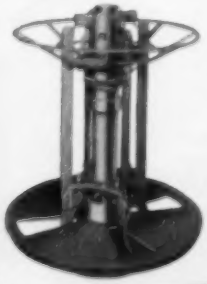
Extra-Heavy Four-Roll Pointer for 1¼" diameter low carbon steel rod

No. 1 Continuous Pointer

Die Stringer with Pointer

No. 1 Combination Die Stringer & Power Pointer

PAY-OFF MACHINES



Riding Type Block Stripping Spider used with Pallet and Pay-Off Ring as a Pay-Off Reel

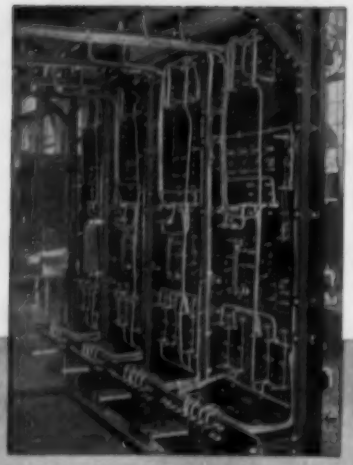
4000# Capacity Pay-Off Stand for paying off from large spools

"Quick on the Draw!"

THE VAUGHN MACHINERY COMPANY

CUYAHOGA FALLS, OHIO, U.S.A.

COMPLETE COLD DRAWING EQUIPMENT Continuous or Single Hole . . . for the Largest Bars and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys



Back of panel shows accessibility of terminal blocks and neat grouping of wiring.

ALLIS-CHALMERS

CONTROL

Modern

Constant Potential Panels for Top Efficiency and Low-Cost Operation

Steel mill control is an Allis-Chalmers specialty. That's why many mills and their consultants are turning to Allis-Chalmers for engineering help and the latest in control equipment . . . equipment like this constant potential panel for dc auxiliary drives. Operating under the roughest conditions, this unit is providing smooth, precision performance . . . affording maximum production and quality with a minimum of outage time and maintenance.

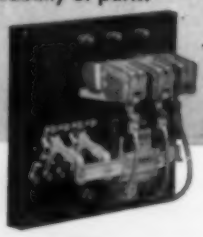
Constant potential and variable voltage systems, magnetic amplifiers, rotating, electronic and mechanical regulators, liquid rheostat — all engineered, built and applied by Allis-Chalmers — are building greater profits in modern mills. When you modernize to meet the double challenge of a growing market and heavy competition, take advantage of Allis-Chalmers experience. Call your A-C representative or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4588

Type 260 Contactor

Quick-quenching arc-centering blowout solves problem of contact burning by sharply curtailing arcing time.

NEW heavy-duty Type 522 contactors and Type 521 relays feature exceptional interchangeability of parts.



Type 522 Contactor

AC

ALLIS-CHALMERS

American Society for Tool Engineers Holds First Western Show Aimed at Growing Area

A CENTURY ago a writer named John Soule wrote, "Go West, young man." Since then enough men have taken his advice, either deliberately or accidentally, to build a Western empire that is doing about 10 per cent of the nation's metalworking—and the empire is still growing.

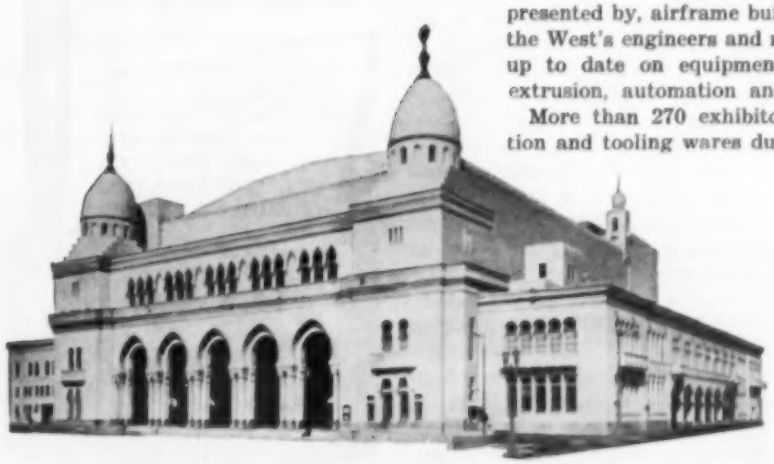
"To continue to increase manufacturing at such a tremendous rate, Western industry is naturally in a buying mood." So says Harry E. Conrad, executive secretary, American Society of Tool Engineers. In a nutshell, this explains the first Western Industrial Exposition, to be held March 14 to 18 at the Los Angeles Shrine auditorium.

Concentrate—"Devoted to tooling, manufacturing equipment, materials and processes, it will be by far the largest and most vital industrial exposition of this type the West has ever seen," according to Joseph P. Crosby, ASTE president. "The only major difference between the Western Exposition and regular ASTE national shows will be that it will be tailored specifically to the needs of Western industry." Regular shows are held in alternate years, next one to be in 1956.

Tailoring the show to Western industry means, for one thing, paying particular heed to the needs of a billion dollar aircraft industry. Many of the papers presented at the meetings will concern methods and processes aimed directly at plane builders. Such subjects as cast plastic tooling as used in aircraft applications and reinforced laminates in aircraft tooling highlight a key session on plastics.

Many other papers will either be aimed at, or presented by, airframe builders. In addition to these, the West's engineers and management will be brought up to date on equipment leasing, tooling for cold extrusion, automation and inspection methods.

More than 270 exhibitors will show their production and tooling wares during the five-day show.



Los Angeles Shrine auditorium

THE DIES
ARE YOURS FREE!

Yes, we do hundreds of stamping jobs without making special tools—and there's a good reason for this. In stamping out laminated shims for over forty years, we've developed much special equipment and tooling unknown in the average stampings house...including an arsenal of blanking dies and punches... and we've acquired unusual production techniques and skills. This equipment and these special skills are at your service without charge.

ROCK-BOTTOM PRICES • BY THREE METHODS!

These three separate production techniques are judiciously applied to save you money on your stamping needs!

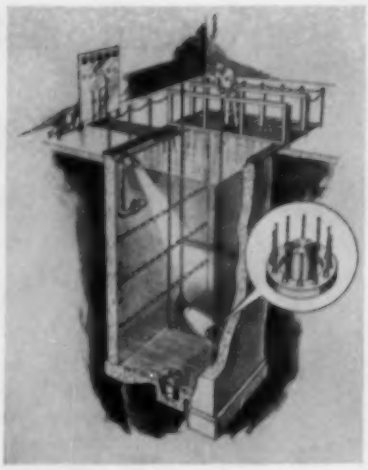
MACHINE CUT METHOD. For half-a-dozen or a few hundred stampings, our *Machine Cut Method* produces the stampings at amazingly low cost.

SHORT RUN METHOD. As quantities increase, we shift to the *Short Run Method*, with stock tooling and temporary dies.

PRODUCTION METHOD. Or we shift to our *Production Method* using high speed self-feeding presses.

For full information, send for our free 12-page booklet "Service in Stampings." And next time you need stampings, let us bid—and discover the savings we offer.

STAMPINGS DIVISION
"ONE PIECE OR ONE MILLION"
LAMINATED SHIM COMPANY, INC.
3403 UNION STREET • GLENBROOK, CONN.



New gamma ray source installation gives boost to . . .

Radiation Research

RADIATION from the inner structure of the atom will have far-reaching effects on industrial materials and processes. Only research can tell us just how much.

As part of this rapidly expanding program of nuclear energy research, Battelle Memorial Institute installed a gamma-radiation source at its Columbus, O., laboratories. One of its important uses, say Battelle scientists, will be to study the effects of radiation on electronic components, lubricants and engineering construction materials. Results of such studies could lead to development of more radiation-resistant materials for tomorrow's nuclear-powered air, sea and land craft.

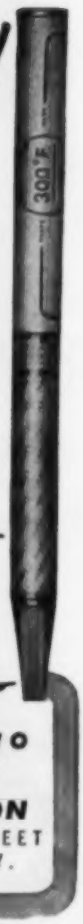
Radiation Source—The gamma-radiation facility is shown in the above sketch. It is designed to house 10,000 curies of cobalt-60 in a water tank 14 ft deep. Initially, the source will consist of 2000 curies of the atomic energy by-product contained in stainless steel tubes, as pictured in the inset. Materials to be irradiated are placed in containers inside the circular arrangement of tubes.

Remote handling of the cobalt-60 and materials to be irradiated is accomplished with 18-ft manipulators. Water above the cobalt-60 provides a natural radiation shield for men conducting research. Spotlights around the tank give needed underwater illumination.

Tempilstik°

FOR ALL
HEAT-DEPENDENT
OPERATIONS

looks like a crayon...
marks like a crayon...
tells temperatures like a precision instrument!



Sixty-three different compositions enable you to determine and control working temperatures from 113° to 2000° F. TEMPILSTIK° marks on workpiece "say when" by melting at stated temperatures—plus or minus 1%.

ALSO AVAILABLE
IN LIQUID AND PELLET FORM
...WRITE PROMOTION DEPT.
FOR SAMPLE TEMPIL° PELLETS...STATE TEMPERATURES OF INTEREST—PLEASE!

Tempil°
CORPORATION
132 WEST 22ND STREET
NEW YORK 11, N. Y.

Visit our booth #323, Western Metal Congress & Exposition, March 28-April 1, Los Angeles

Using a VICTOR No. 310 torch butt with two S2 extensions and No. 8 type 4 tip, Joe Wyman (Shreve Welding Co., Oakland, Calif.) repairs cast iron heating boiler header with VICTOR No. 1 low fuming manganese bronze rod. Inset photo shows 5/64" build-up on undersize castings, done with same No. 310 torch but with No. 5 type 4 nozzle and VICTOR No. 6 square cast iron rod.

VICTOR'S wider work range pays off from the day you select your first VICTOR welding outfit on through a lifetime of reliable service. You buy the torch you need for your present work, add extensions, cutting attachments or special nozzles as they're needed. Result: top-quality equipment that's always perfectly matched to your needs!

Whatever the job . . . welding, cutting, heating, brazing, descaling . . . you'll start it quicker, finish it sooner with versatile VICTOR equipment!

VICTOR for welding

LOOK FOR THE VICTOR DEALER SIGN *. . . ask him to show you why it costs less to own and operate VICTOR.*

VICTOR EQUIPMENT COMPANY

10

Mfrs. of welding & cutting equipment; hardfacing rods; blasting nozzles.

3821 Santa Fe Ave.
LOS ANGELES 58

844 Folsom Street
SAN FRANCISCO 7

Los Angeles Plays Host to American Society for Metals at Pan-Pacific Auditorium

ANOTHER Western record is about to fall. This one will drop when the American Society for Metals stages its Ninth Western Metal Exposition and Congress in Los Angeles, March 28 to April 1.

The combination meeting and show is expected to be bigger than the one held in 1953. More than 300 exhibitors will display their products in the huge Pan-Pacific auditorium during the five-day event. Concurrently, a series of meetings, sponsored by ASM and some 20 co-operating societies, will be held in the Ambassador hotel.

Variety—The meetings, roundtable and panel discussions, will run the gamut of metal and metal-processing subjects, including titanium, powder metals, high-strength steels, die materials, forming methods for sheet metals, tool materials and metallurgy for the electronics engineer.

Focus—Both the meetings and the exposition will focus attention on the problems of Western industry. This includes aircraft and electronics, but it also sweeps the wide swath of a diversified metalworking corner.

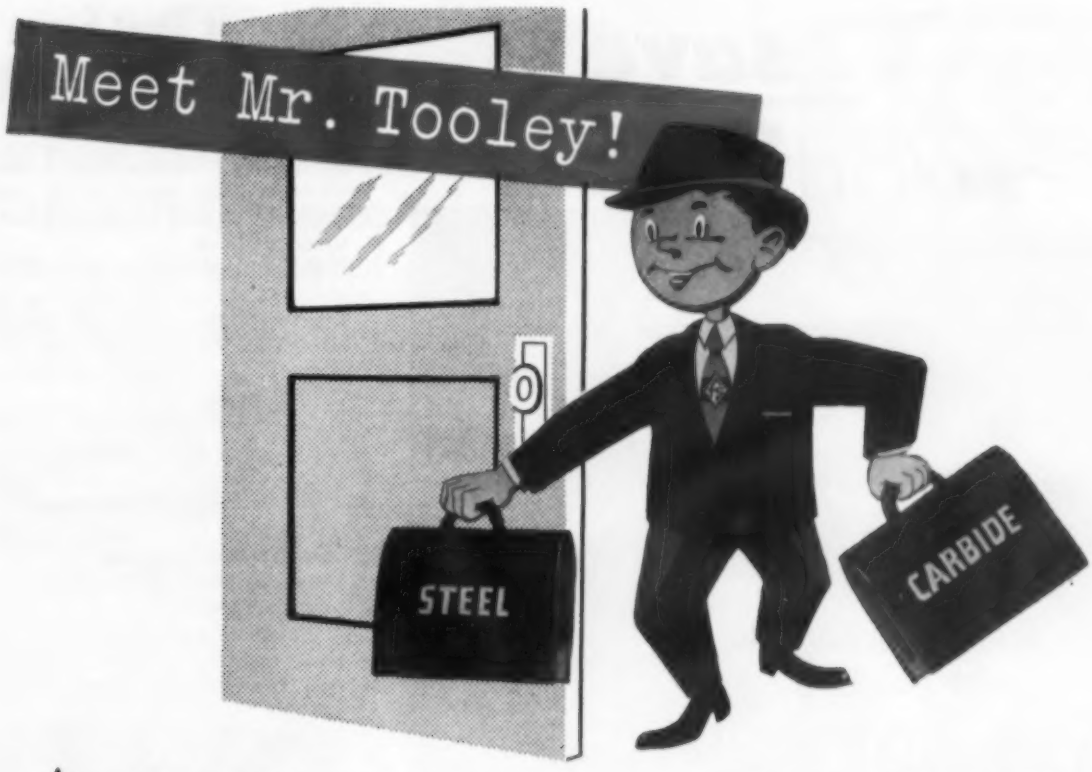
An all-day session on aircraft and rocketry has been included by the American Welding Society in its four days of sessions. Papers will include those on silver alloy brazing of electrical connections, resistance welding of airframe structures, titanium alloy fusion weldability, and silver brazing of titanium to titanium.

The electronics sessions will discuss the metallurgy of germanium and silicon for transistors and diodes, magnetic materials for electron equipment, materials for resistors and capacitors and application of special brazing alloys.

In a special foundry session, papers will be presented on investment casting, ductile iron, shell molding.

This will be the second big show in three weeks in Los Angeles—clear evidence of the growing importance of the area both as a supplier of metal goods and as a buyer of cost-cutting production equipment and processes.

Pan-Pacific auditorium



AMERICA is a land of symbols. The things we use and eat and wear, the services rendered to us, are often better known by their symbols than by their generic product names.

From Sunny Jim of yesteryear, who put packaged cereal on America's breakfast table, to Reddy Kilowatt who dramatizes electricity . . . "trade" symbols and characters have become loved and respected as representing reliability, versatility and often uniqueness.

Our Mr. Tooley is such a *symbol* to all industry where tooling for production is so important that it may even mean the difference between profit and loss.

For Mr. Tooley typifies the *unique* position that Firth Sterling occupies among producers of tools and tooling materials . . . that of making and selling *both steels and carbides* . . . the *right* steel or carbide or the exact combination needed to do each job best . . . from a single manufacturing source.

Thus Mr. Tooley has taken his place among American trade characters symbolizing a service of *greater* value built on Firth Sterling's ability to make *unbiased* recommendations and capacity to furnish *complete* shop tooling needs.

Firth Sterling

—INC—

GENERAL OFFICES: 3113 FORBES ST., PITTSBURGH 30, PA.

OFFICES AND WAREHOUSES*: BIRMINGHAM CHICAGO* CLEVELAND DAYTON DETROIT* HARTFORD* HOUSTON LOS ANGELES* NEW YORK PHILADELPHIA PITTSBURGH WASHINGTON WESTFIELD, N.J.

PRODUCTS OF FIRTH-STERLING METALLURGY

High Speed Steels
Tool and Die Steels
Stainless Specialties
High Temperature Alloys
Sintered Tungsten Carbides
High Temperature Cermets
Chromium Carbides
Zirconium
Firth Heavy Metal

FREE!

NEW 48-PAGE CATALOG to help you select the RIGHT TOOLS and TOOLING MATERIALS

You'll find this catalog valuable in selecting proper machining materials: carbide standard tools, tips, inserts, blanks; steel toolholder bits, drill rod, ground flat stock. Get your copy from your Firth Sterling distributor or write direct.

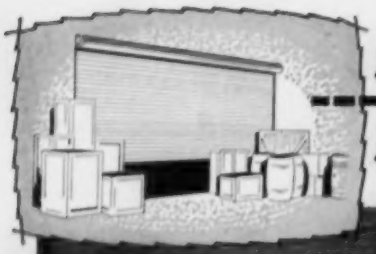
CLIP AND MAIL

R-307

Firth Sterling Inc.
3113 Forbes St., Pittsburgh 30, Pa.

Please send me the new 48-Page Firth Sterling Catalog.
I am particularly interested in: ☐ Steel ☐ Carbide

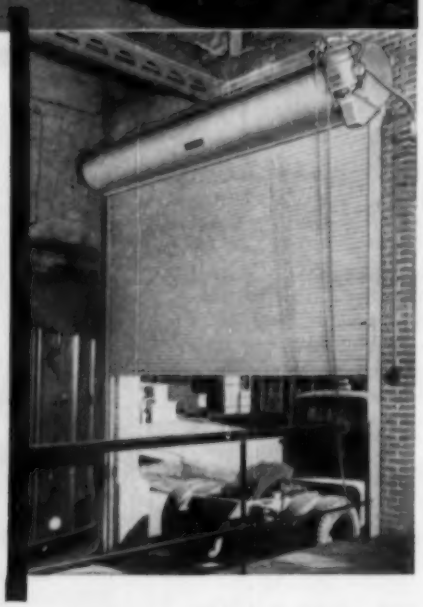
Name_____
Title_____
Company_____
Address_____
City_____ Zone_____
State_____



save space

with

Kinnear Steel Rolling Doors



Opening straight upward, Kinnear Rolling Doors coil out of the way above the opening, into the compact hood mounted on the wall (or often within the wall, where desired).

They give you full use of all space around doorways at all times. *No extra space of any kind is needed for their opening action and closing action.*

The rugged interlocking steel-slat curtain *(originated by Kinnear)* also gives you added protection against fire, theft, vandalism, storms, and accidental damage.

For extra resistance to weather and corrosion, Kinnear Rolling Doors are heavily galvanized, with 1.25 ounces of pure zinc per square foot of metal (ASTM standards).

Kinnear Rolling Doors are built any size, for easy installation in either old or new buildings of any construction. Manual-lift, chain, or crank operation—or motorized push-button control. ***Write for full details.***

KINNEAR ROLLING DOORS
Saving Ways in Doorways

The KINNEAR Mfg. Co.
FACTORIES:
1780-1800 Fields Ave., Columbus, Ohio
1742 Yosemite Avenue, San Francisco 24, Calif.
Offices and Agents in All Principal Cities

Continuous Sheet Gaging

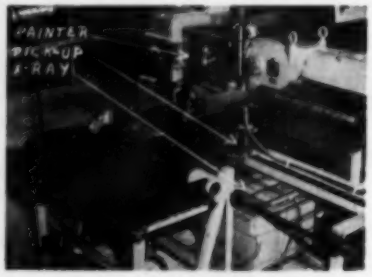
X-ray checks sheet from edge to edge, alerts operator if faulty section occurs

AN X-RAY thickness gage mounted on a sheet metal slitter is a foolproof way to check steel used to make tubing.

The slitter slices rolls of 36-in. sheet steel into as many as 56 separate strips. Fifteen different thicknesses of metal are used, depending on the wall thickness of the tubing specified.

The gage consists of a chassis console, an x-ray source and a pickup. The x-ray source is mounted with the pickup and aligned by means of a C-frame. Sliding the source and pickup back and forth across the sheet makes it possible to gage any section.

Old Method — Before the x-ray thickness gage was put in operation, the sheet steel was checked



X-RAY THICKNESS GAGE
. . . mounted on sheet metal slitter

by a micrometer which measured only the edge of the steel. The entire roll could not be checked because of the time it took.

The old method had the further disadvantage of not being able to measure the middle portions of the sheet which occasionally were off size.

New Method — Now, the steel runs through the slitter at 600 fpm and is continually gaged. In an out-of-tolerance situation, a signal lamp goes on, alerting the operator. An air brush containing marker die paints the faulty section.

Through this method, Rochester Products Division, General Motors Corp., Rochester, N. Y., is realizing savings in decreased inventory and reduced down time of the brazed and welded tube mills.

Here's Marvibond*

a new vinyl-to-metal laminating process that gives sheet metal products all these advantages...

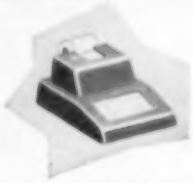
- lasting protection against rust and corrosion
- practically any surface effect desired
- superior abrasion resistance
- outstanding resistance to perspiration and most chemicals
- uniform coverage of almost any thickness
- good sound-deadening properties
- less costly fabrication

WHY NOT Marvibonded...?

..auto instrument panels and interior trim

vending machine housings

waste baskets



business machine housings

air conditioner cabinets

Window moldings and dashboards of Marvibonded laminates could be permanently clad with vinyl material to match door upholstery and seat trim. And practically any choice of texture is possible–from glare-free matte finishes to rich leather-like grains.

There'd be no checking or flaking, no worries about scratched paint—no need for waxing or other care. The tough, chemical-resistant vinyl cleans with a wipe.

What's more, the vinyl surface would always be warm and pleasant to the touch. Marvibonding ends problems of rust from moisture condensation. And it helps to deaden sound, as well as insulate against squeaks from metal to metal contact.

Why not Marvibonded panels and trim! Plenty of excellent reasons *why*. Excellent reasons why for hundreds of similar applications—like radio and television housings, business machine covers, vending machines, air conditioners, waste baskets, and many many more.

Better see what Marvibond can mean to your product! Write the address below today.

*Pat. applied for

Naugatuck Chemical

Division of United States Rubber Company
Naugatuck, Connecticut

US RUBBER

BRANCHES: Akron • Boston • Charlotte • Chicago • Los Angeles • Memphis • New York • Philadelphia • IN CANADA: Naugatuck Chemicals, Elmira, Ontario
Rubber Chemicals • Synthetic Rubber • Plastics • Agricultural Chemicals • Reclaimed Rubber • Latices • Cable Address: Rubexport, N.Y.

for the "NEW LOOK" in VERTICAL TURRET LATHES

SEE THE NEW

BULLARD CUT MASTER

Completely redesigned with many exclusive engineering features that make it the *most modern on the market today* including:

★

PENDANT CONTROL

Exclusive Bullard design, for maximum machine control from a movable pendant station. Start and stop spindle; selection of speeds, feeds and directional movement of all heads in feed or traverse are quickly and easily accomplished from the Pendant. Interlocks and a stop-all stick provide safety for both operator and machine.

★

ELECTRIC CONTROL PANEL

Accessible yet concealed and protected from oil, dust and other foreign matter.

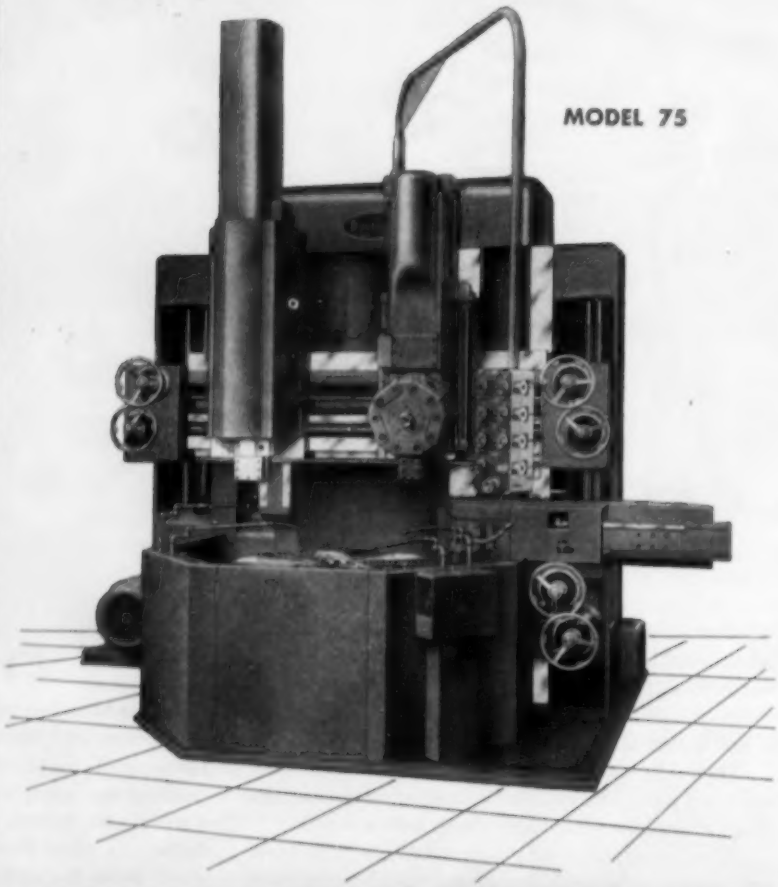
★

POWER INDEXED MAIN TURRET

(Optional)

Five sided turret for "run of the mill" jobs. Four sided turret for production jobs.

Available in 26, 36, 46, 56, 66 and 76 inch sizes.

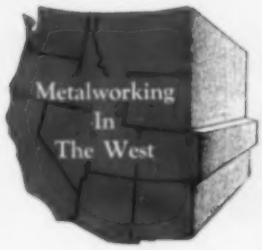


MODEL 75

SEVENTY FIFTH BULLARD ANNIVERSARY

THE BULLARD COMPANY

BRIDGEPORT 2, CONN.



Made of plastic, these tools have a synthetic rubber derivative added. You can vary the degree of flexibility to fit a particular application

Plastic mandrel is used in bending thin-walled metal tubes. It's one example of the ways that plastics pay off in metalforming

Flexible Tools Aid Fabrication

By JOHN DELMONTE
General Manager, Furane Plastics
Los Angeles

FLEXIBLE SNAKES have taken their place in the tooling setup for engine cowlings.

The so-called snake actually is a long wedge-shaped member of flexible epoxy plastic. The job is done at the San Diego, Calif., plant of Convair Aircraft.

Bend and Stretch—The snake is used to prevent excessive distortion of a formed shape during the second operation. First, the flexible wedge is laid on the stainless sheet and an edge is folded back over it on a power brake.

Next, the sheet (with the wedge still in place) is stretched to shape. As the last step, the snake is removed and the radii set by drop hammer tooling, faced with flexible plastic.

Variable — On this and other forming jobs, the flexible material has saved much of the time required to prepare metal tooling—and often with a significant cost reduction.

Rigid epoxy tooling materials may be adjusted to meet the physical requirements of the process. These adjustments for increased flexibility and toughness are made by adding synthetic rubber derivatives to the basic resin.

Recipe—Mixture for the flexible material includes the resin, a hardener and a polysulphide rubber derivative (modifier). The most important influence on degree of flexibility is the rubber additive, although some variation is possible by controlling the hardener concentration.

You can achieve almost any degree of flexibility. It must be remembered, however, that the gain in flexibility (as measured by elongation) usually is offset by loss in tensile strength of the resin.

Also, the viscosity stability of an epoxy-polysulphide rubber derivative is poor and such combinations are preferably made just before the castings or toolings are to be poured.

Range—Widely varying elastic properties can be given to the material, as shown in this table. In these tests the basic resin, Epocast 2, and the hardener remained constant. Only the modifier was varied to produce the range of results. The materials were cast and cured at room temperature. Tests were conducted several weeks after the samples were prepared. Castings are most flexible 1 or 2 days after pouring, and they'll gradually stiffen to some

Composition	Modulus of elast. in compression, psi
1	400,000
2	100,000
3	60,000
4	20,000
5	2,000

...and NOW COLD DRAWN LEADED STEEL BARS PRODUCED BY J&L STEEL

They're leaded... they're free-cutting...

available in both Bessemer and Open Hearth grades

J&L LEADED STEEL BARS PROVIDE:

1 ***Faster Machinability*** ... because with J&L's Leaded Steels much higher cutting speeds are possible.

2 ***Increased Tool Life*** ... because the lead addition in J & L's Leaded Steels lowers the coefficient of friction thereby reducing heat that develops in the cutting edges of tools.

3 ***Improved Surface Finishes*** ... because J&L's Leaded Steels machine to fine surface finishes.

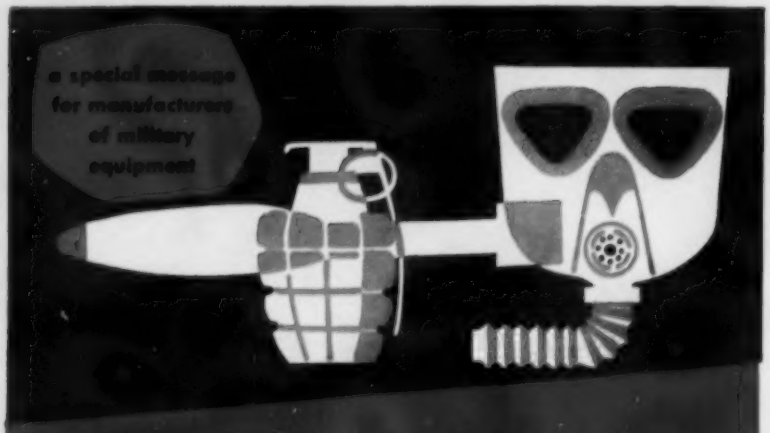
4 ***Lower Overall Costs*** ... because the free-cutting qualities of J & L's Leaded Steels boost production and, at the same time, reduce part rejections.

CALL J&L TODAY

Phone the J&L District office or warehouse nearest you

Jones & Laughlin STEEL CORPORATION — *Pittsburgh*

J&L STEEL



need a finish to beat these specs?

specify IRIDITE

AN-C-170 MIL-S5002 MIL-C-5541 AN-P32
AMS-2402A USA-50-80-11A J.Q.D. No. 144B
USA 57-93-2A O.S. No. 1374 USA 57-0-2C AN-P61
A-XS-1607 QQ-P-416 QQ-Z-325 MIL-3151—
if you're finishing under these or similar specifications, here's how you can use Iridite:

ON ZINC AND CADMIUM you can get highly corrosion resistant finishes to meet any military or civilian specifications and ranging in appearance from olive drab through sparkling bright and dyed colors.

ON COPPER . . . Iridite brightens copper, keeps it tarnish-free; also lets you drastically cut the cost of copper-chrome plating by reducing the need for buffing.

ON ALUMINUM Iridite gives you a choice of natural aluminum, a golden yellow or dye colored finishes. No special racks. No high temperatures. No long immersion. Process in bulk.

ON MAGNESIUM Iridite provides a highly protective film in deepening shades of brown. No boiling, elaborate cleaning or long immersions.

AND IRIDITE IS EASY TO APPLY. Goes on at room temperature by dip, brush or spray. No electrolysis. No special equipment. No exhausts. No specially trained operators. Single dip for basic coatings. Double dip for dye colors. The protective Iridite coating is not a superimposed film, cannot flake, chip or peel.

WANT TO KNOW MORE? We'll gladly treat samples or send you complete data. Write direct or call in your Iridite Field Engineer. He's listed under "Plating Supplies" in your classified telephone book.

ALLIED RESEARCH PRODUCTS
INCORPORATED
4004-06 E. MONUMENT STREET • BALTIMORE 5, MD

Flexible "snake" is hidden behind the flange on this stainless aircraft engine cowling. It holds the edge radius during second operation

extent on aging.

Mandrel — Flexibility requirements depend on the fabrication to be performed. For forming thin-walled metal tubes on the Parker tube bending machine, a flexible mandrel is used. Threaded studs for attachment of the mandrel are cast into position.

The composition of this mandrel is: 100 parts by weight, Epocast 4-B or 4-C, 35 to 40 parts modifier, and 10 parts hardener. Epocast 4-C is aluminum in color, 4-B is cream colored.

Less Flexible—Not all fabrication tools require the flexibility displayed by the mandrel or flexible "snakes." The formulations may be entirely rigid or semirigid as in the manufacture of drop-hammer punch or die facings for limited production. The tough die facing is usually cast on Kirksite. Facings are poured about ⅜ to ½-inch thick against accurate plaster patterns and are set up to finished dimensions without the grinding or finishing operations required on tool faces. Furthermore, the resilient epoxy punch facing is poured without allowance for metal thickness.

Irons Wrinkles—As a result, it is possible to form and draw metals that vary in thickness to some extent. These techniques have been particularly successful in fabricating aluminum alloy sheet metal for aircraft components.

Flexible pads have been invaluable in ironing out wrinkles and setting radii in the drop hammer forming of aluminum alloys. The desired profile is cut from the poured pad and placed on the drop hammer die.

Life Expectancy—On drop-ham-

ERIE

In the good old days

WHEN GRANDPA RAN THE BIG FORGING HAMMER

Though those were the "horse and buggy" days, we had one automobile customer,

Ohio Packard OF WARREN

Nice people, but "very exacting in their demands", according to our President.

Other names, like these were on our list of Customers:

OTTO, FOOS,
BESSEMER,
PIERCE-CROUCH,
FOREST OIL.

(Remember those companies?)

Maybe we're "name-droppers", but those gr. nd old names helped establish us as the

THE GREATEST NAME IN FORGING HAMMERS

A 100-lb. Erie self-contained Hammer of about 1910

"IN OUR 60TH YEAR"
ERIE FOUNDRY CO.
ERIE, PA.

Aluminum aircraft component is shaped in plastic-faced tools. Sheets can vary slightly in thickness—wrinkles are ironed out

mer tooling, complexity of the part being shaped and the selection of the tool material both affect tool life. Production runs of anywhere from 10 to 10,000 have been reported for a number of parts.

Because formulations are designed to set at room temperature, they adhere well to clean metal, including zinc alloys. They also can be stripped from metal surfaces, aided by chemicals, which loosen them.

Temperature—At 30 to 40° F much of the resiliency may disappear in the increased tensile strength and lower elongation, though when warmed to 80 to 90° F optimum qualities may be displayed. This suggests that tools stored during cold weather before use should be given a full chance to attain room temperature.

In production the severity of the forming process may generate considerable frictional heat within the material. The higher temperatures accompanied by increased yield, will also lead to lower tear strength. Recognizing these limitations, the tool designer and fabricator can make allowances or adjustments in formulation to achieve optimum serviceability.

IN TODAY'S

forge shop

WHERE FASTER FORGING REQUIRES AN ALL-STEEL HAMMER

WHEN each hammergang's 'down time' is so costly if mechanical failure sets in,

WHEN competitive bidding in mass production requires every effort to be costed at minimum

WHEN product perfection must be taken for granted as buyers specify less and less tolerance allowances

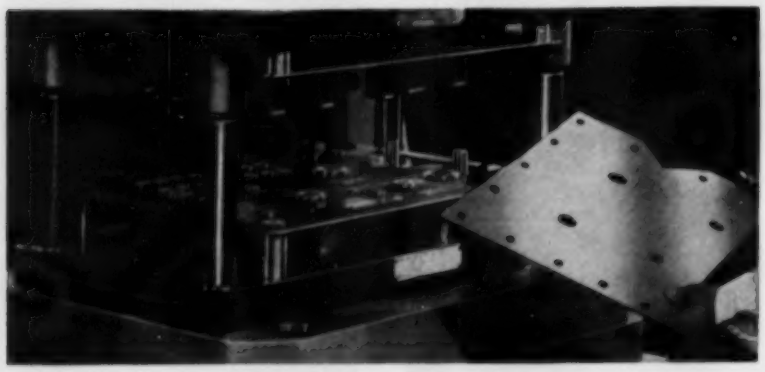
The tireless performance of the all-steel construction (in all stressed parts, upper works, frames, and anvils) makes

ERIE, MORE THAN EVER, THE GREATEST NAME IN FORGING HAMMERS

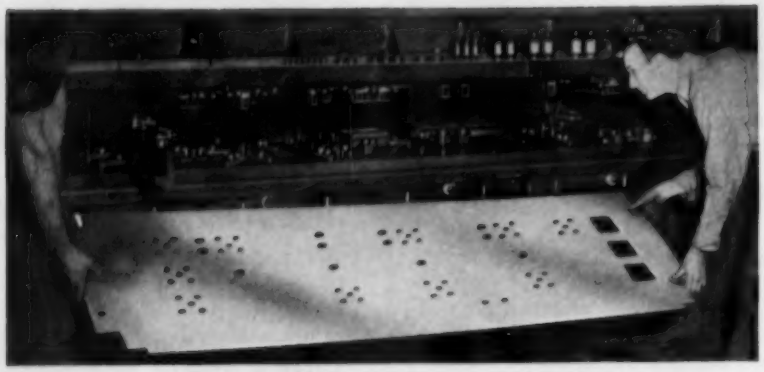
50,000 lb. Erie Steam Hammer — the largest ever built

"IN OUR 60TH YEAR"
ERIE FOUNDRY CO.
ERIE, PA.

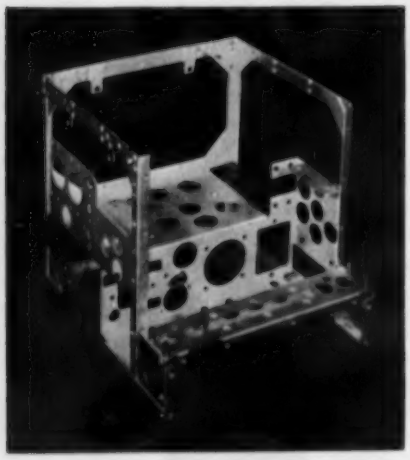
OVER 2,000 PLANTS *are making up their Metal Perforating Die Sets by Whistler methods*



WHISTLER **MAGNETIC PERFORATING** DIES



WHISTLER **ADJUSTABLE PERFORATING** DIES



- Lower die-making costs.
- Start production quicker.
- Save work handling labor.
- Increase press production.
- Versatile in job application.
- Perforate materials to ¼" thick mild steel.
- Combine horizontal and vertical perforating operations.
- Work in practically any size or type of press.
- All parts re-usable and interchangeable.
- Precision assured on short or long runs.
- Parts interchangeable right in the press.
- Magnetic dies assembled on templates.
- Adjustable dies assembled on Tee slot die sets.
- Save floor and storage space.
- Die investment not "tied up."

SEE FOR YOURSELF *Without Obligation*

Our *illustrated* Catalogs show the simplicity, economy and versatility of Whistler methods. See for yourself why Whistler customers are the biggest names in industry.

WHISTLER DIES ARE CUTTING COSTS FROM COAST TO COAST

S. B. WHISTLER & SONS, INC.
742 Military Road **Buffalo 23, New York**

Flux Takes Heat in Stride

A new flux for silver alloy brazing of stainless, chromium heat resisting alloys, chromium and tungsten carbides has the ability to withstand heating at 1400 to 1600°F for short times. Life of the flux is increased at lower brazing temperatures.

The product contains a strong deoxidizer. Its oxide is a flux former. In a sense, the flux regenerates itself during the heating cycle. This provides the longer activity span required for elevated temperatures. After brazing, it can be removed with hot water.

Among important applications are its use with AMS 4772 brazing alloy (flow point 1515°F) for brazing jet engine compressor blades and the attachment of chromium carbide and tungsten carbide tool tips.

Called Special Handy Flux Type B-1, it can be obtained from Handy & Harman, New York.

Materials Handling Show Set

New systems of materials handling designed to keep pace with the growth of automation will highlight the conference of the American Material Handling Society at Chicago, May 16-18.

During the week, May 16-20, the Sixth National Materials Handling Exposition also will be presented. Both events will take place at the International Amphitheatre.

Theme—Exhibits and the conference will be keyed to the theme, "The Concept of Obsolescence." Conference topics will consider the problems of factories which must continue production in outmoded, multistory buildings. Materials handling in factories where plant layout is of the latest design is another part of the conference program.

The show will demonstrate all types of materials handling equipment under simulated factory conditions. More than 200 companies will exhibit. For more information and advance registration cards, write Clapp & Poliak Inc., 341 Madison Ave., New York 17, N. Y.

The men who know PLATING say...

Chandeysson

CUTS COSTS OF POWER CONVERSION

Take a look at *your* conversion costs. Perhaps they could be lessened by installation of a Chandeysson . . . the generator with a 50-year record of truly remarkable performance. Its high efficiency and amazing longevity bring the most enthusiastic endorsements from its hundreds of owners. Power is power . . . but there's only one Chandeysson! An installation can save *you* money. Write, or mail coupon for full information.

"still using first Chandeysson"

"we overload them heavily"

"practically nothing for repairs"

"16 hours a day for 20 years"

"20-25% overload regularly"

"23 years in service"

"our first unit still satisfactory"

"rough treatment doesn't hurt it"

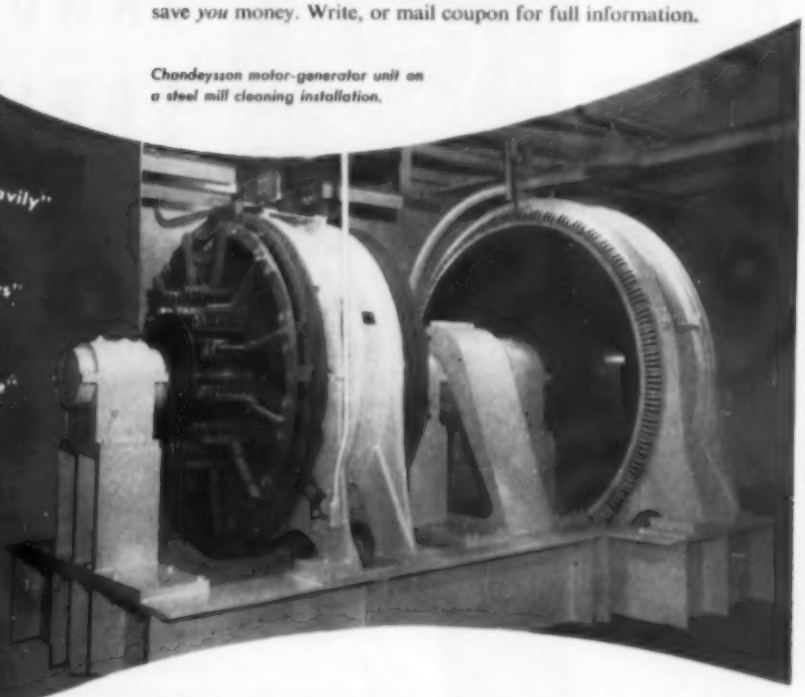
"48 years in service"

"nothing for maintenance"

"in 20 years bought only brushes"

"thoroughly sold on Chandeysson"

Chandeysson motor-generator unit on a steel mill cleaning installation.



CONVERT WITH CHANDEYSSON AND SAVE 4 WAYS...

- 1. Use Less Power
- 2. Get More Out Of The Power You Pay For
- 3. Be Sure Of Power When You Need It Most
- 4. Enjoy Lifetime Power Dividends

GOLDEN JUBILEE

CHANDEYSSON ELECTRIC COMPANY
4076 Bingham Avenue • St. Louis 16, Missouri

CHANDEYSSON ELECTRIC COMPANY
4068 Bingham Avenue
Saint Louis 16, Missouri

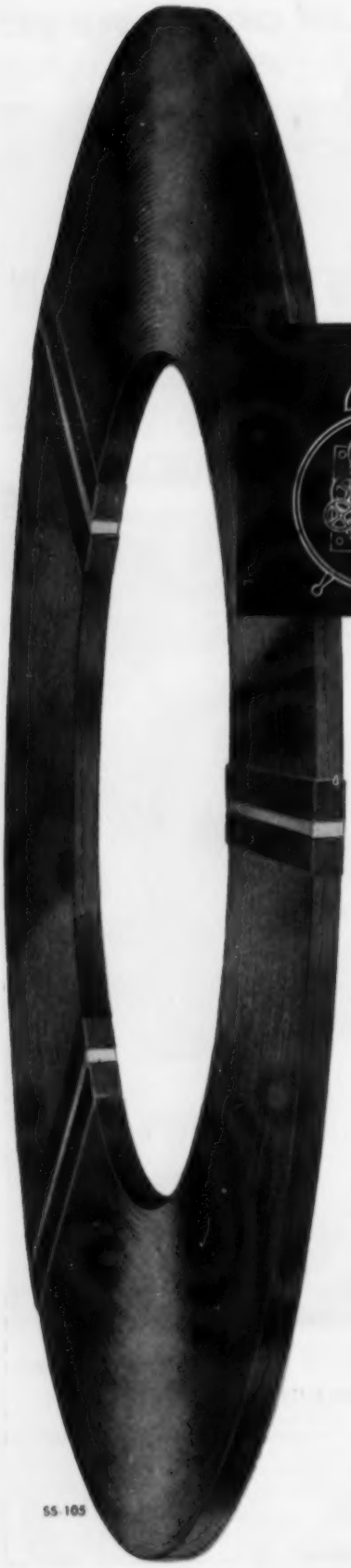
Please send me a copy of Bulletin D-101

Name.....

Company.....

Address.....

City..... Zone..... State.....



For Years of Repeat Performance

specify SANDVIK SPRING STEEL

Sandvik Steels have a record of success in applications which demand years of consistent, continuous performance.

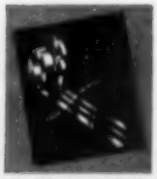
In products such as clock and watch springs, compressor valves, piston ring springs, vibrator reeds . . . wherever fatigue life is *vital*, you'll find Sandvik untiring in service.

If your product requires high fatigue life, fine surface finish, uniform physical properties and accurate gauge, try Sandvik.

You can get Sandvik strip steels:

- **In special analyses for specific applications.**
- **Precision-rolled in thicknesses to fit your requirements.**
- **In straight carbon and alloy grades.**
- **Annealed, unannealed or hardened and tempered.**
- **Polished bright, yellow or blue.**
- **With square, round or dressed edges.**
- **Wide range of sizes in stock—also slitting facilities available.**

Ask your nearest Sandvik office for further information or technical assistance.



FREE SANDVIK CATALOG. Gives thickness, width, hardness, type of edge and weight in pounds per hundred ft. Write for your copy.

SANDVIK SWEDISH SPECIALTY STRIP STEELS

are used for Textile Machine Parts such as sinkers, needles, etc. • Band Saws (metal, wood and butcher) • Camera Shutters • Clock and Watch Springs • Compressor Valves • Doctor Blades • Feeler Gauges • Knives such as cigarette knives, surgical, etc. • Razor Blades • Shock Absorbers • A Wide Variety of Springs • Trowels • Reeds: Vibrator, Textile, etc., • Piston Ring Segment and Expanders • and many other applications

SANDVIK STEEL, INC.

111 EIGHTH AVE., N. Y. 11, N. Y. WAtkins 9-7180
230 N. Michigan Ave., Chicago 1, Ill., FRanklin 2-5638
1736 Columbus Rd., Cleveland 13, Ohio, CHerry 1-2303
3609 E. Olympic Blvd., Los Angeles 23, Cal., ANgelus 3-6761
SANDVIK CANADIAN LTD., P.O. Drawer 430, Station O, Montreal 9, P.Q.
SANDSTEEL SPRING DIVISION. New York. Industrial Springs.
SANDVIK SAW & TOOL DIVISION. New York. Saws and Tools.

Sandvik Quality Steels

SS-105

1866

STEEL

NEW PRODUCTS and equipment

Write directly to the company for more information

Wire Machine Available in Two Models

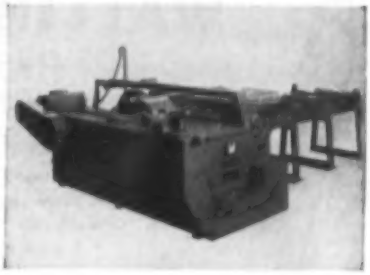
The No. 2-C3 is for use with wire $\frac{1}{16}$ to $\frac{3}{16}$-in., the 2-C4 for wire from $\frac{3}{32}$ to $\frac{1}{4}$-in. They feature: Rigid straightener arbor support brackets for minimum vibration; a completely enclosed straightener arbor guard to keep oil off the machine and V-belts; and heavy V-belts with large pulleys. Electric control buttons are flush-mounted. There is a higher speed 5-die straightener arbor, mounted on ball bearings.

A solenoid-operated trip mechanism is available which is recommended for small diameter wire sizes. These wire machines process all commonly used types of material. Lewis Machine Co., Dept. 1C, 3441 E. 76th St., Cleveland, O.

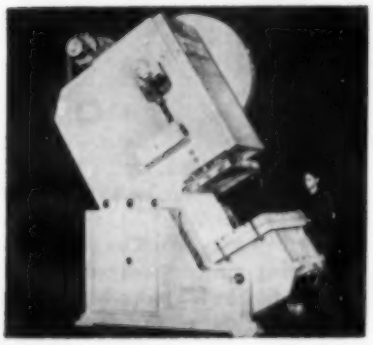
Hydraulic Nonferrous Cold Sawing Machine

The machine comes in two basic models. The standard model (for billets, wire, bars, slabs, etc.) is a new model of the standard machine of the Gustav Wagner Machine Tool Works. For ferrous metals, the long-stroke, heavy-duty hydraulic unit is suitable for cutting cakes up to 60 x 12 in.

Nonferrous models have hydraulic feed up to 60 in. with rapid automatic return and automatic chip removal. They are powered on the main spindle with 60 or more horsepower. The helical main gears provide a smooth but powerful drive. The machine is being supplied in five speed ranges. With the use of dual speed motors, its speed ranges can be doubled. The company also offers the Wagner automatic saw sharpening machines and high-speed, segmental-type saw blades. Klingelhofer Machine Tool Co., Industrial Park, Kenilworth, N. J.



Gap Press with Steel Frame



This single point, 150-ton press is known as the GI-150. Options include a fixed or inclinable base and standard, centralized or cabinet leg controls. Standard stroke is 6 in. Standard speeds are 80 or 105 strokes per minute for the flywheel presses and 30 strokes per minute for geared presses. Bed area is 30 x 50 in. and slide area 24 x 34 in. The press illustrated has cabinet legs and an electric motorized inclining mechanism. It can be inclined from vertical to 30 degrees in about 3 minutes and has a patented clutch in gear arrangement, with all gears totally enclosed, running in oil.

Minster bearing housings are rigidly supported from all angles to provide maximum support for the crankshaft under capacity loads. Supporting members distribute work pressure evenly to the crown section. Minster Machine Co., Minster, O.

take your "HEADACHES"

to a specialist . . .

WALLINGFORD STEEL

FOR QUALITY STAINLESS STRIP

We specialize in easing "headaches" brought on by the need for . . . an improved product . . . better production . . . reduced fabricating and finishing costs . . . fewer rejects . . . less down-time. We prescribe . . .

WALLINGFORD STAINLESS STRIP

- Thinnesses to .002".
- Accuracy to ± .0001".
- Meets *rigid* specifications for size, finish, analysis, temper.
- Has smooth, straight edges.
- Gages uniformly.
- Draws easily.
- Punches cleanly.
- Special sections rolled to your exact design.

Write today. We'll meet the challenge of your most persistent product, cost and production "headaches" with a staff of specialists — engineers, metallurgists and production experts — well-qualified to administer effective treatment.

THE WALLINGFORD STEEL CO.

SINCE 1922

WALLINGFORD, CONN., U.S.A.

STAINLESS • ALLOY • HIGH CARBON • LOW CARBON • STRIP • STAINLESS WELDED TUBES AND PIPE

NEW PRODUCTS and equipment

Materials Handling System

The Flow-mation system consists of work station hopper racks and sliding door boxes that automatically open and discharge their contents. The new line is complete —from roll-over and bottom dumps to double-size hoppers. It includes a single-station unit that contains both the box holding the pieces requiring work and the receiving box in the same rack.

The basic unit consists of a box

with a guillotine-type door and a portable hopper stand. When the fork lift operator places the box on the stand, it automatically lifts the guillotine door, discharging the contents into a large capacity hopper. Other units include a hopper box with stand, a double-size hopper box and roll-overs and funnel boxes. Powell Pressed Steel Co., Hubbard, O.

Cradle and Straightener

Floor space is saved by directing the loop of stock over the coil with an upright stock guide and an internal stock guide under the coil. By eliminating the customary, long loop bewteen the cradle and feeding mechanism, up to 72 sq ft of floor space can be saved. The coil stock cradles have built-in power straighteners. The coil stock is carried on two large-diameter, smooth-finished, powered rollers mounted in self-aligning, ball-bear-

THESE

High Quality

A. P. GREEN

REFRACTORY PRODUCTS

REDUCE DOWN TIME AND OPERATING COSTS

A. P. Green refractory products have proved in service that high quality pays off in greater tonnages, smoother operation, and lower maintenance costs.

There is an A. P. Green product designed to meet industry's requirements for almost any type of service. You'll find that it pays to standardize on A. P. Green quality products.

For specific recommendations on your refractory problems, get in touch with your local A. P. Green distributor. He is listed in the yellow pages of your phone directory.

A. P. GREEN FIRE BRICK COMPANY
Mexico, Missouri, U. S. A.

PLANTS: Mexico, Mo. • Woodbridge, N. J. • Sulphur Springs, Texas
In Canada: A. P. GREEN FIRE BRICK COMPANY, LTD.
Toronto 15, Ontario

A. P. Green REFRACTORY PRODUCTS

DISTRIBUTORS IN THE PRINCIPAL CITIES OF THE WORLD

You're Just Hours Away...

from a GENERAL CHEMICAL Supply Point!

Albany, N. Y.
Atlanta, Ga.
Baltimore, Md.
Bay Point, Calif.
Birmingham, Ala.
Boston, Mass.
Bridgeport, Conn.
Buffalo, N. Y.
Camden, N. J.
Charlotte, N. C.
Chicago, Ill.
Cleveland, O.
Denver, Colo.
Detroit, Mich.
East St. Louis, Ill.
Edgewater, N. J.
Hodges, Wash.
Houston, Texas
Jacksonville, Fla.
Kalamazoo, Mich.
Los Angeles, Calif.
Marcus Hook, Pa.
Milwaukee, Wisc.
Minneapolis, Minn.
New Orleans, La.
New York (L. I. C.), N. Y.
Oakland, Calif.
Passaic (Dundee), N. J.
Pittsburgh, Pa.
Portland, Ore.
Providence, R. I.
Pulaski, Va.
San Francisco, Calif.
Savannah, Ga.
Seattle, Wash.
Syracuse, N. Y.

36 STREAMLINED DISTRIBUTING STATIONS TO SERVE YOU...

to assure the fastest, smoothest service possible for its customers, General Chemical maintains one of the most efficient chains of warehouses and distributing stations in the country for acids, alums, phosphates and many other industrial chemicals. Presently, it has 36 streamlined distribution centers strategically located from coast to coast. Each is fully stocked with the chemicals required in the area it serves. Each is geared to supply your needs for any of the products listed below.

Why not check up on how the "G. C." distributing station in your territory can be put to work for you. For further information, just phone or write the nearest General Chemical office.

...WITH THESE PRODUCTS!

Acids Alums Phosphates
Sodium Compounds Fluorine Derivatives
Other Heavy Chemicals

Basic Chemicals for American Industry

GC
Allied Chemical

GENERAL CHEMICAL DIVISION

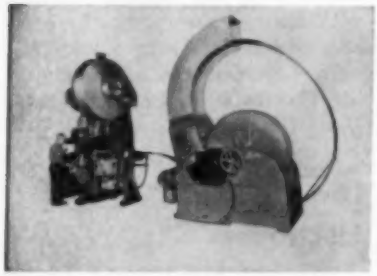
ALLIED CHEMICAL & DYE CORPORATION

40 Rector Street, New York 6, N. Y.

Offices: Albany • Atlanta • Baltimore • Birmingham • Boston • Bridgeport • Buffalo • Charlotte • Chicago Cleveland • Denver • Detroit • Greenville (Miss.) • Houston • Jacksonville • Kalamazoo • Los Angeles Minneapolis • New York • Philadelphia • Pittsburgh • Providence • San Francisco • Seattle • St. Louis Yakima (Wash.) • In Wisconsin: General Chemical Company, Inc., Milwaukee

In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver

ing pillow blocks. Rotating side plates hold the coil stock in place and provide easy alignment with the press. The side plates are quickly adjusted, to accommodate various coil widths by means of a hand crank on each side. The coil stock can be loaded by overhead crane or fork-lift truck through

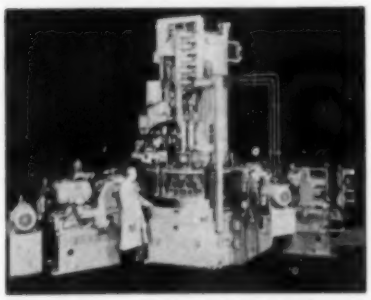


the open end. With ramp loading, an air operated shock absorber is recommended to absorb oil weight in loading.

The built-in straightener will handle stock up to 3/16-in. thickness. All rolls are hardened and ground. Except for adjustable straightening rolls, each set of rolls is power driven. A 4 to 1 speed drive motor provides a wide range of operating speeds. Special Equipment & Sales Co., 3949 E. 9 Mile Road, Hazel Park, Mich.

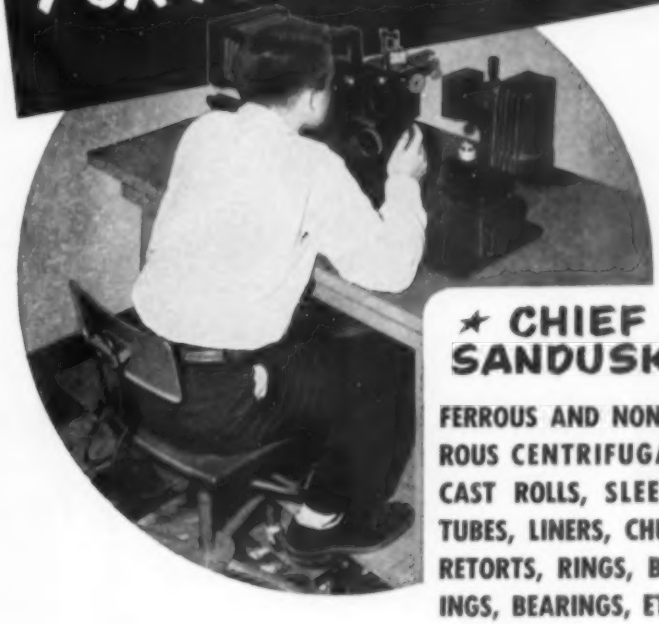
Automatic Machine

This eight-station machine features a 96-in. diameter index table. It is ideally adapted to close-tolerance boring, drilling, tapping, facing and line reaming on a wide variety of parts at high production rates. Fixtures permit the



mounting of two medium-sized production parts in each fixture and processing two parts at one time at each station. The 14-ft

NOW--LOOK TO CHIEF SANDUSKY FOR FERROUS TOO!



★ CHIEF ★ SANDUSKY

FERROUS AND NON-FERROUS CENTRIFUGALLY CAST ROLLS, SLEEVES, TUBES, LINERS, CHUTES, RETORTS, RINGS, BUSHINGS, BEARINGS, ETC.

With the recent installation of high-frequency induction melting furnaces, Chief Sandusky now supplies industry with a diversified line of both ferrous and non-ferrous cylindrical castings. In addition to the convenience of single-source supply, we provide sound technical assistance from both the field and greatly expanded laboratory facilities.

With a skill born of 40 years' experience, time tested in hundreds of plants, you can call on our experienced technicians with confidence. They're ready to help you with manufacturing special castings to specification or working with your staff in developing unusual types to solve new problems.

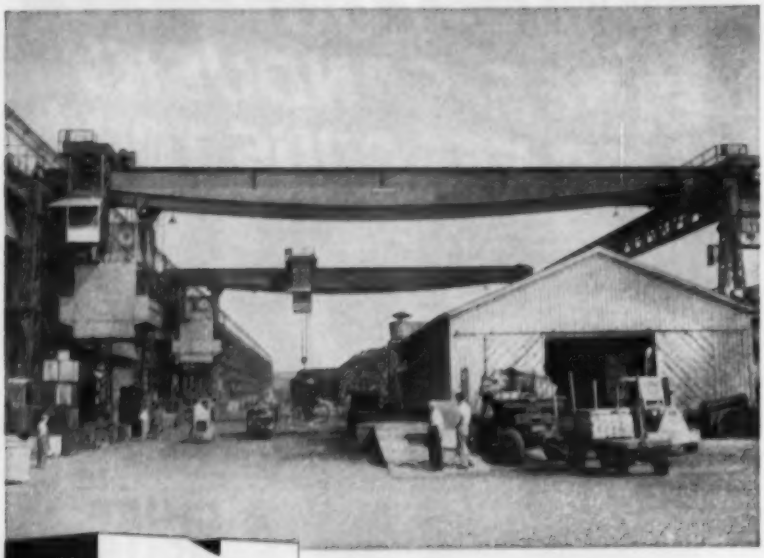
Look to Chief Sandusky as a continuing dependable source of both ferrous and non-ferrous custom quality centrifugal castings.

C. M. LOVSTED & CO. INC., SEATTLE, WASH. • TYNES BROS., BIRMINGHAM, ALA. • CORDES BROS., SAN FRANCISCO AND WILMINGTON, CALIF.

SANDUSKY FOUNDRY and MACHINE CO.

615 W. Market Street Sandusky, Ohio

Look overhead..see "NORTHERN"



NORTHERN CRANES uniquely adapted *for the Foundry Yard!*

These two NORTHERN OVERHEAD ELECTRIC TRAVELING CRANES illustrate one of the many ways in which overhead materials handling equipment can be adapted for fully integrated production processing.

These 7.5-ton, 100-foot span cranes are installed in the foundry yard of a large automotive manufacturing company. To provide better vision and control of loading and unloading in all crane operations, the operators' cabs are attached to and travel with the crane trolleys.

Transfer loading to other handling equipment by means of batch weighing and loading hoppers was designed, built and installed by the customer company.

Here is another example in the short-cutting of repetitive, unprofitable materials handling. It demonstrates the substantial benefits of imaginative thinking in solving cost problems in all areas of plant operation.

Let us send you Bulletins G-700 and SE-108.

NORTHERN CRANES–HOISTS–TRAVELATORS

NORTHERN ENGINEERING WORKS
210 CHENE ST., DETROIT 7, MICH.

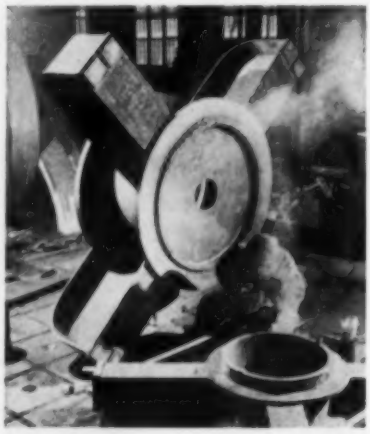
NEW PRODUCTS and equipment

high center column has hardened and ground flat ways that provide adequate vertical head travel for accurate line reaming operations where tools are piloted in both the bushing plate and fixture.

The table is indexed hydraulically through a fluid motor and gear train. A centralized lubrication system has fixtures equipped with fittings permitting the operator to lubricate each one individually. Snyder Tool & Engineering Co., 3400 E. Lafayette Ave., Detroit 7, Mich.

Low Hydrogen Electrode

Powdered metal added to the coating is said to make possible higher speeds and to help stabilize operation of the electrode. Spatter is low and slag removal is easy. The Strikeasy LH-1 is usable on alloy and mild steels and meets the requirements of the E-6016 classification in the as-welded condition and E-7016 in the stress-



relieved condition. The photo shows a welder using the low hydrogen electrode to join heavy metal parts.

In a controlled test, the deposition rate was 61 per cent faster than conventional E-6016 electrodes. A rate of 6.58 lb per hour was obtained with a $\frac{5}{16}$-in. Strikeasy LH-1 electrode at 300 amps ac (optimum current). The rate was 4.08 lb per hour for the $\frac{5}{16}$-in. conventional, E-6016 electrode oper-

* Built & Sold by Waterbury-Farrel In The United States Of America And Canada Only

SCREW SLOTTING NEWS

REVOLUTIONARY, NEW WATERBURY-FARREL MACHINE SLOTS 500 TO 2000 FINISHED BLANKS PER MINUTE

Unprecedented Saw Life Per Grind

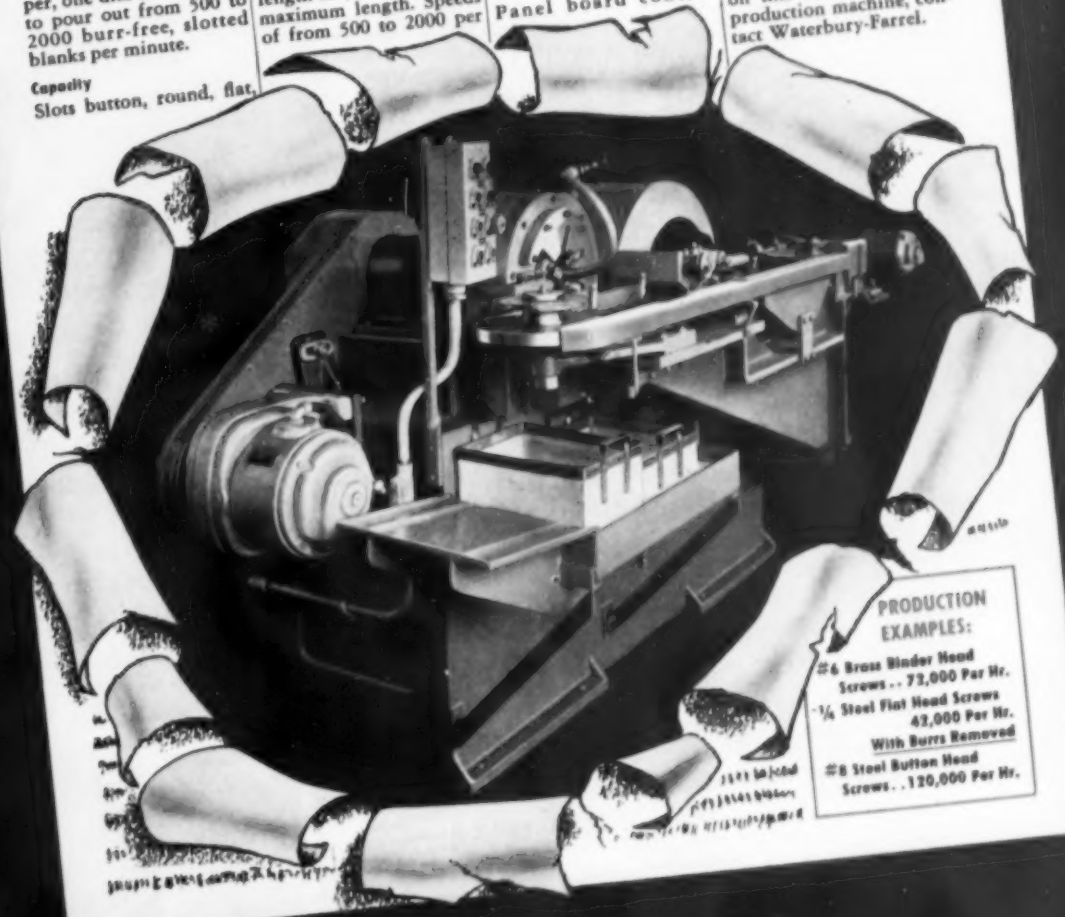
This new Waterbury-Farrel #1 High Speed Screw Head Slotting Machine uses only one hopper, one dial and one saw to pour out from 500 to 2000 burr-free, slotted blanks per minute.

Capacity
Slots button, round, flat, flat oval, fillister, truss or binder heads (of brass or standard lower carbon machine steel), in sizes from #6 by ¼" minimum length to ¼ by 3" overall maximum length. Speeds of from 500 to 2000 per min. depend upon shape and size of head and whether steel or brass is used.

Fully Electrically Driven . . . Lubrication Safety Interlocked

Panel board control switches are safety interlocked so that oil flow must be started first. Then the saw, dial and feed are each started in that order by separate switches.

For further information on this outstanding new production machine, contact Waterbury-Farrel.



PRODUCTION EXAMPLES:
#6 Brass Binder Head Screws . . 72,000 Per Hr.
¼ Steel Flat Head Screws With Burrs Removed 42,000 Per Hr.
#8 Steel Button Head Screws . . 120,000 Per Hr.

WATERBURY-FARREL FOUNDRY & MACHINE CO. • WATERBURY, CONN.
Offices: Chicago, Cleveland and Millburn, N. J.

A FEW OF THE MANY TYPES OF METAL WORKING MACHINERY MADE BY WATERBURY-FARREL • *COLD PROCESS BOLT AND NUT MACHINERY*—Headers (all types) • Re-headers • Trimmers • Thread Rolling Machines • Slotters Nut Tappers, etc. *POWER PRESSES*—Crank, Cam and Toggle; also Rack and Pinion Presses • Multiple Plunger Presses • Hydraulic Presses, etc. *MILL MACHINERY*—Rolling Mills • Wire Flattening Mills • Chain Draw Benches • Slitters and various accessory mill machinery. *WIRE MILL EQUIPMENT*—Continuous Fine Wire Drawing Machines (Upright Cone and Tandem) • Bull Blocks • String-up Machines • Spoolers, etc.

FOUNDED WATERBURY FARREL 1851

WF 5

New HIGH PRESSURE STEAM Fan Heater

Gives Savings You Never Had Before

The first heater to make High Pressure Steam really trouble-free and practical in plant heating. Every engineer should understand its original method; write for Niagara Bulletin and performance data.

HOW IT OPERATES: — A dual coil system makes use of all heat, both sensible and latent. High pressure steam enters the upper coil, shown on the diagram below. Its condensate drains into a trap. Then this high pressure condensate is released into the header of the lower coil. It instantly flashes into steam at vapor pressure.

Any high pressure condensate that remains liquid is carried to the vapor condensate return header by a drain tube that also gives off its heat into the air stream.

The vapor condenses in the lower coil. Its condensate is kept at a high level in the return leg by a wier in the return header so that all its heat is made useful and it is sub-cooled by contact with the coldest air entering the heater. Vacuum condensate return to boiler is vapor free.

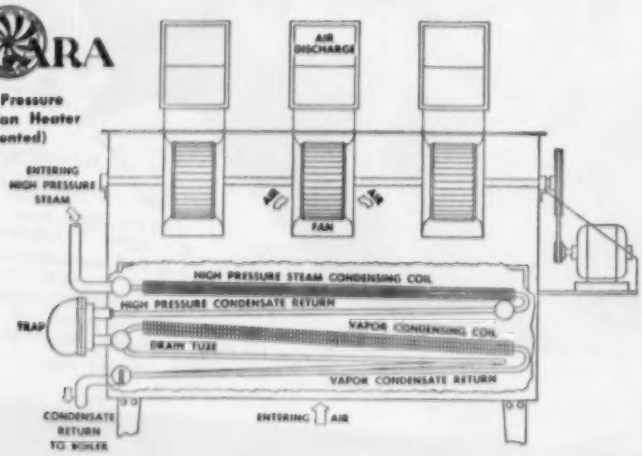
HOW IT SAVES IN COST: — Piping is much simpler and less costly than in low pressure systems. Much secondary piping, traps and big valves are not needed. Pipe sizes are smaller.

HOW IT SAVES IN OPERATION: — Waste is prevented. Every BTU goes where you want it. No dump traps or hot wells waste live steam.

HOW IT SAVES IN UPKEEP: — Condensate flow is even, vapor free, easily handled. No sudden surges of condensate in starting. No hammering, no hard wear and tear on system. Properly engineered for the job, final air temperatures are not excessive; heat easily directed where needed; no flashing of low pressure condensate. Heaters are self-draining on shut-down. Heaters are strongly built; all coils including the condensate drain tubes are hairpin bend, stress relieving. Use thru four heating seasons has proven these advantages in large scale plant heating.

NIAGARA

High Pressure Steam Fan Heater (Patented)



NIAGARA BLOWER COMPANY
Dept. S, 405 LEXINGTON AVE., NEW YORK 17, N. Y.

Please send Bulletin 109 on the Niagara High Pressure Steam Fan Heater.

Name.....

Address.....

ated at an optimum current of 225 amps ac. General Electric, Schenectady 5, N. Y.

Air Chucks for Chucking Machines

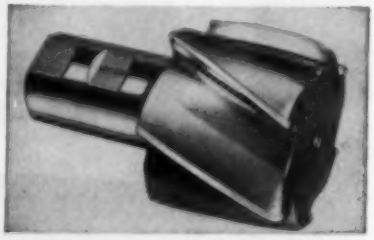
These chucks have the hardened keyways as a standard feature at no extra cost.

All important bearing surfaces, as indicated by the arrows on the photograph, are hardened to increase wear and life. The chucks

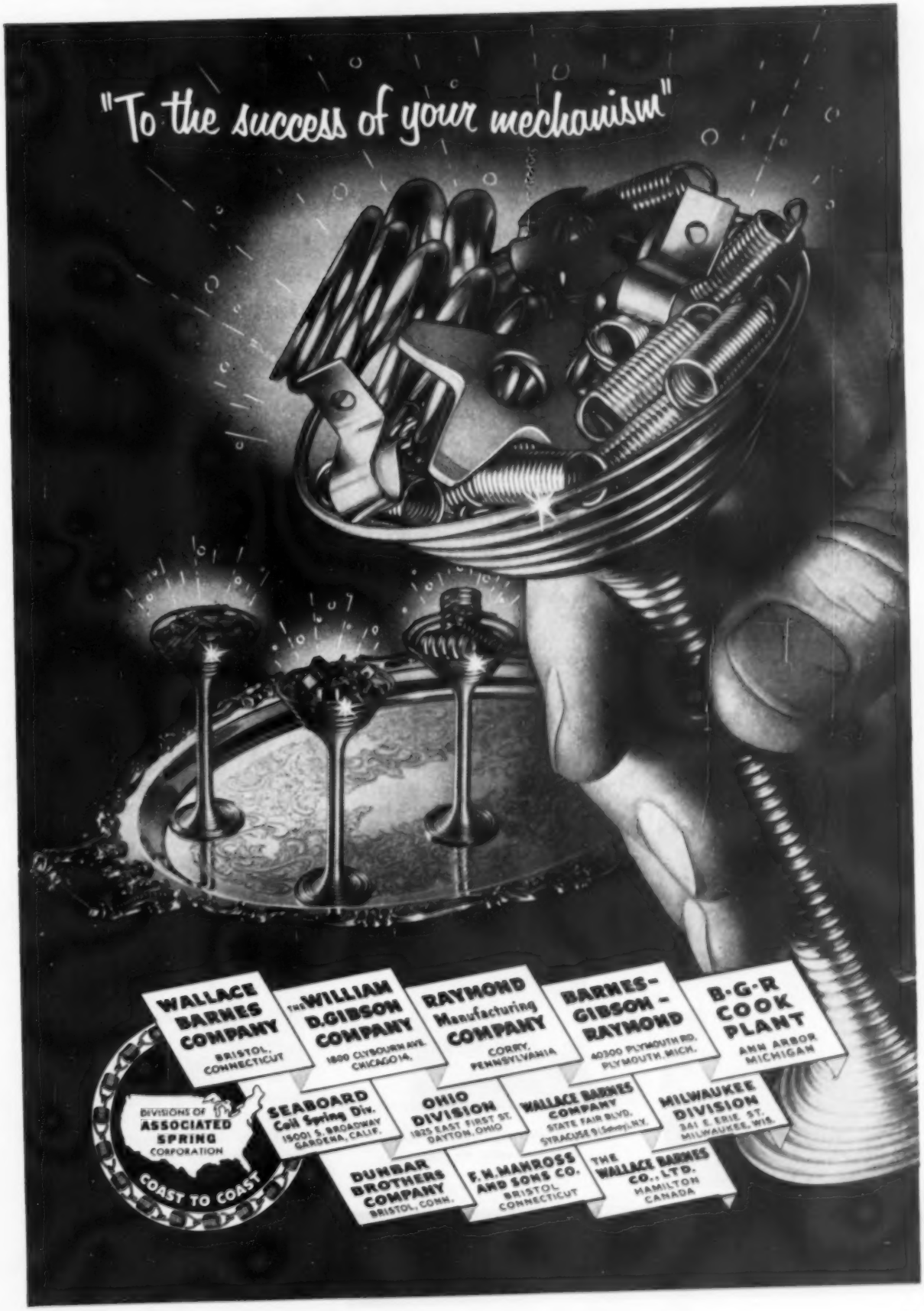
are made in 10 and 12 in. diameters with 2 or 3 jaws—6½ and 8 in. sizes will be available soon. Literature is available on request. Buck Tool Co., 2015 Schippers Lane, Kalamazoo, Mich.

Carbide-Tipped Helical Milling Cutters

The cutters combine all the advantages of preform true helical carbide tips and true helical seat



pockets. The large inserts are the entire length of flutes. This maintains a constant shear cutting action the full depth of the cut. Superior finishes are obtained with 25 to 30 per cent less horsepower


"To the success of your mechanism"
WALLACE BARNES COMPANY
BRISTOL, CONNECTICUT
The WILLIAM D. GIBSON COMPANY
1800 CLYBOURN AVE. CHICAGO 14, ILL.
RAYMOND Manufacturing COMPANY
CORRY, PENNSYLVANIA
BARNES-GIBSON-RAYMOND
40300 PLYMOUTH RD. PLYMOUTH, MICH.
B-G-R COOK PLANT
ANN ARBOR MICHIGAN
DIVISIONS OF ASSOCIATED SPRING CORPORATION
COAST TO COAST
SEABOARD Coil Spring Div.
19001 S. BROADWAY GARDENA, CALIF.
OHIO DIVISION
1825 EAST FIRST ST. DAYTON, OHIO
WALLACE BARNES COMPANY
STATE FAIR BLVD. SYRACUSE 9 (Senry), N.Y.
MILWAUKEE DIVISION
341 E. ERIE ST. MILWAUKEE, WIS.
DUNBAR BROTHERS COMPANY
BRISTOL, CONN.
F. N. MANROSS AND SONS CO.
BRISTOL CONNECTICUT
THE WALLACE BARNES CO., LTD.
HAMILTON CANADA

Guaranteed Results from FURNACES · OVENS · DRYERS

in the OVER-ALL JOB by CONTINENTAL

Continental Twin-Chamber Annealer of the recirculating type with automatic conveyor transfers and close tolerance control for time-temperature cycle
Two Continental Continuous Controlled Atmosphere Annealers, roller rail type, complete with transfer cars and conveyor systems
Continental Stamping Annealer, continuous roller rail type, complete with basket-handling conveyors, and automatic controls for work handling and temperature cycles
Six Continental "Top Hat" Covers Type Furnaces for bright annealing high carbon steel, complete with gas generator and automatic controlled time-temperature cycling

for military production...

Whatever your heat process problems in plant conversion for military production, CONTINENTAL has the answer.

CONTINENTAL jobs begin with analysis of the requirements, then the selection and development of proper methods for greatest results. Finally follows the design, the building, and installation of the equipment including necessary work-handling accessories and control devices—delivering a COMPLETE UNITIZED PRODUCING PACKAGE with results guaranteed.

The broad experience of CONTINENTAL offers you a prompt, sure solution to your change-over program.

CONTINENTAL INDUSTRIAL ENGINEERS, INC.
176 W. Adams Street, Chicago 3, Illinois

District Representatives:
Ridgewood, N. J. • Indianapolis • St. Louis • Detroit
Cincinnati • Milwaukee • Cleveland • Pittsburgh

PLANNED MILITARY PRODUCTION
Write for Booklet No. 135

FURNACES · PRODUCTION LINES · CONTINENTAL · SPECIAL MACHINES · COMPLETE PLANTS
MANUFACTURERS · ENGINEERS · CONTRACTORS FOR OVER A QUARTER OF A CENTURY

NEW PRODUCTS and equipment

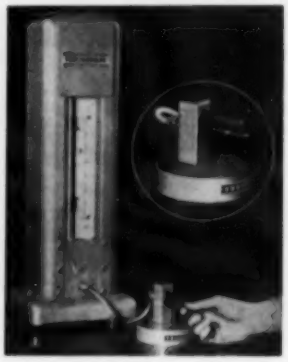
and 2 to 3 times longer tool life.

Union has furnished to specifications, a wide variety of the cutters in shell end mills, slab mills, side and end mills. In the aircraft industry, they have been successfully used to cut nonferrous materials. Union Twist Drill Co., Athol, Mass.

Gage Inspects Tiny Parts

The photo shows this Precisionaire gage being used to inspect the 0.078 in. inside width of a television tube component.

The gage is slipped over a chrome-plated spindle incorporating a single air jet and is held in position by a small hold down



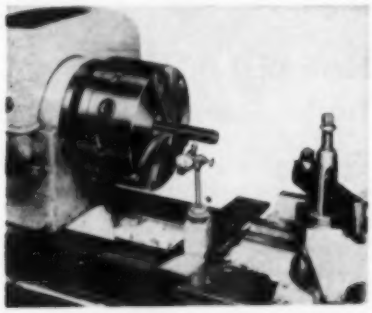
wheel. Instantly, the position of the float in the air column indicates whether the width is in tolerance or the amount it is oversize or undersize. Uses include the inspection of tiny television, radio and electric components. Sheffield Corp., Dayton 1, O.

Two New Chuck Lines

The Tru-Set chuck is guaranteed to be accurate to 0.0002 in. total indicator reading. Micro-screw adjustment of the chuck back enables the lathe operator to align the work piece practically within the limits of the accuracy of the lathe. It is available with three or six jaws, each having three operating pinions for opening and closing. Each chuck is supplied with two sets of jaws and is available in sizes of 4 to 12 in. diameter. The

body is fabricated from Meehanite and guaranteed against breakage.

The Windsor independent and universal chucks also are available in sizes of 4 to 12 in. in diameter.



The body is fabricated from Meehanite. The chuck is available for straight recess and type L and D1 American spindle nose mountings. Horton Chuck Div., E. Horton & Son Co., Windsor Locks, Conn.

Automatic Locating and Drilling Machine

It automatically locates and drills in rapid sequence any number of holes up to ½-in. in diameter. Model 24 handles work up to 24 in. in width and 48 in. in length or longer. Manual layout of templates, panels, chassis, printed circuits, castings, etc. is completely

eliminated. The machine is equipped with an adjustable speed drilling unit (275 to 4250 rpm) which automatically works to any depth. The rate of drill feed can be adjusted.

The operator sets length and width dimensions in increments of 0.001 in. on decimal dials and presses direction controls to set the machine in motion. The rest

When you use Perm-A-Clor for your degreasing operations, you know why Detrex has become industry's largest direct supplier of trichlorethylene. The reason is very simple—you get more for your money!

To begin with, Perm-A-Clor is premium grade solvent. Through Detrex' modern producing facilities and improved techniques, it costs no more than ordinary solvent.

Just as important are the significant savings you enjoy as a result of the Detrex field service organization . . . largest in the industry. This is an automatic, cost-free benefit for all Perm-A-Clor users.

Specifically, a Detrex field technician visits you to check the quality and efficiency of your degreasing operations. Because Detrex produces both equipment *and* solvent, our technicians understand the behavior of solvent as well as the design and operation of the equipment in which it is used. These specialists know every factor which influences solvent economy—time cycles, parts drainage, control of air-mix solvent vapors, and complete distillation, to name a few.

Training of operators and supervisors is also a regular function. In short, the Detrex service man becomes a technical advisor on your staff whose watchful eye can save you hundreds of dollars per year without fuss or fanfare . . . an established fact in plants the country over.

To measure the value for yourself, let the nearest Detrex technician prove what he can do to cut your degreasing costs, boost your quality. The coupon below will start the wheels in motion, please use it.

I would like the Detrex Field Technician to point out ways to cut my degreasing costs at no charge to me for the service. Please have him call.

NAME _____ TITLE _____

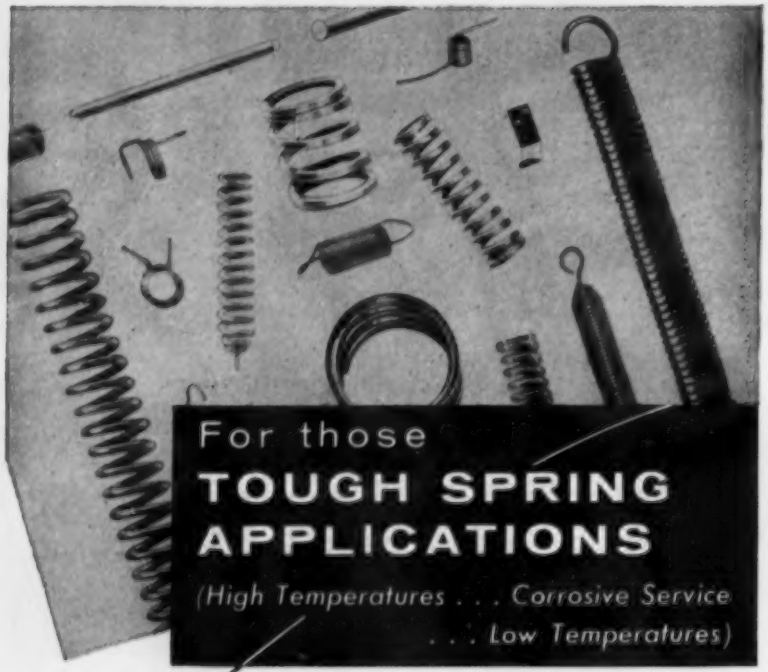
COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

DETREX CORPORATION

DEPT. S-101, BOX 501, DETROIT 32, MICH.



Use
ALLOY Wire...Rod...Strip

Spring Designers: You can readily select a material with just the right combination of properties for your tough spring applications from the alloys we fabricate into wire, rod and strip. Alloys such as Monel, K Monel, Inconel, Inconel X, Nickel, Duranickel, Austenitic, Ferritic and Martensitic Stainless Steels and special alloys are available in a wide range of tempers and special treatments. These materials feature high strength and fatigue properties at elevated temperatures, good ductility at sub-zero temperatures, low magnetic permeability and excellent resistance to a wide variety of corrosive conditions.

Alloy Metal Wire Division engineers will work closely with you to develop any special engineering and fabricating properties you may require. Your inquiries are always welcome.

Send today for our new Nickel Alloy and Stainless Steel Properties Charts.

ALLOY METAL WIRE DIVISION

HKP H. K. PORTER COMPANY, INC.
Prospect Park, Pennsylvania

NEW PRODUCTS and equipment

is automatic. If desired, the drilling operation can be controlled manually. Hillyer Instrument Co. Inc., 54 Lafayette St., New York 13, N. Y.

Earth Drill Driven By Tractor Power Take-Off

The drill has been added to the line of matched attachments for this 50-hp, HD-5 crawler tractor. It is mounted without disturbing either the shovel or dozer already on the tractor. Adjustment for drilling positions is hydraulically controlled. With the series of flights available, the drill can bore holes up to 24 in. in diameter.

Jobs performed include fence post, telephone and telegraph pole drilling, exploration for foundations, soil sampling and similar requirements. It permits pioneer drilling in off-the-road as well as easily accessible places. Allis-Chalmers Mfg. Co., Tractor Div., Milwaukee 1, Wis.

Double-Spindle Vertical Hydrohoner

The model 730-2 design incorporates two basic units, with separate columns for each spindle. It is equipped with Microdial automatic abrasive feedout, stone-wear compensation and Microsize automatic sizing control. It has automatic coolant start and stop and an automatic time cycle. A three-speed transmission assembly controls the rotation on each unit. Reciprocation is hydraulically

Announcing
The New UNIT Model 510
Challenger

DESIGNED with a BACKGROUND of 3/8 YARD EXPERIENCE

Evidence of highest quality engineering and construction includes alloy steels and forgings • anti-friction bearings • modern transmission design with involute splines to add strength and reduce wear • straight-in-line engine mounting with torque converter • trunnion supported tapered drums to eliminate bending stress on drive shafts • easily accessible hydraulic clutches • minimum number of main machinery gears enclosed in one-piece cast gear case • force feed lubrication • self-aligning replaceable hook shoes distribute applied pressure over maximum area • interchangeability of parts simplifies maintenance, cuts costs. All these UNIT advantages mean more profitable operations for you.

Why it's BEST to INVEST in modern UNIT models

Because each feature has been proven to contribute substantially to the Life, Performance and Efficiency which have made present and previous UNIT products readily acceptable.

Send for Bulletin Now... Use Coupon!

UNIT CRANE & SHOVEL CORP.
6521 W. Burnham St. • Milwaukee 14, Wis., U.S.A.

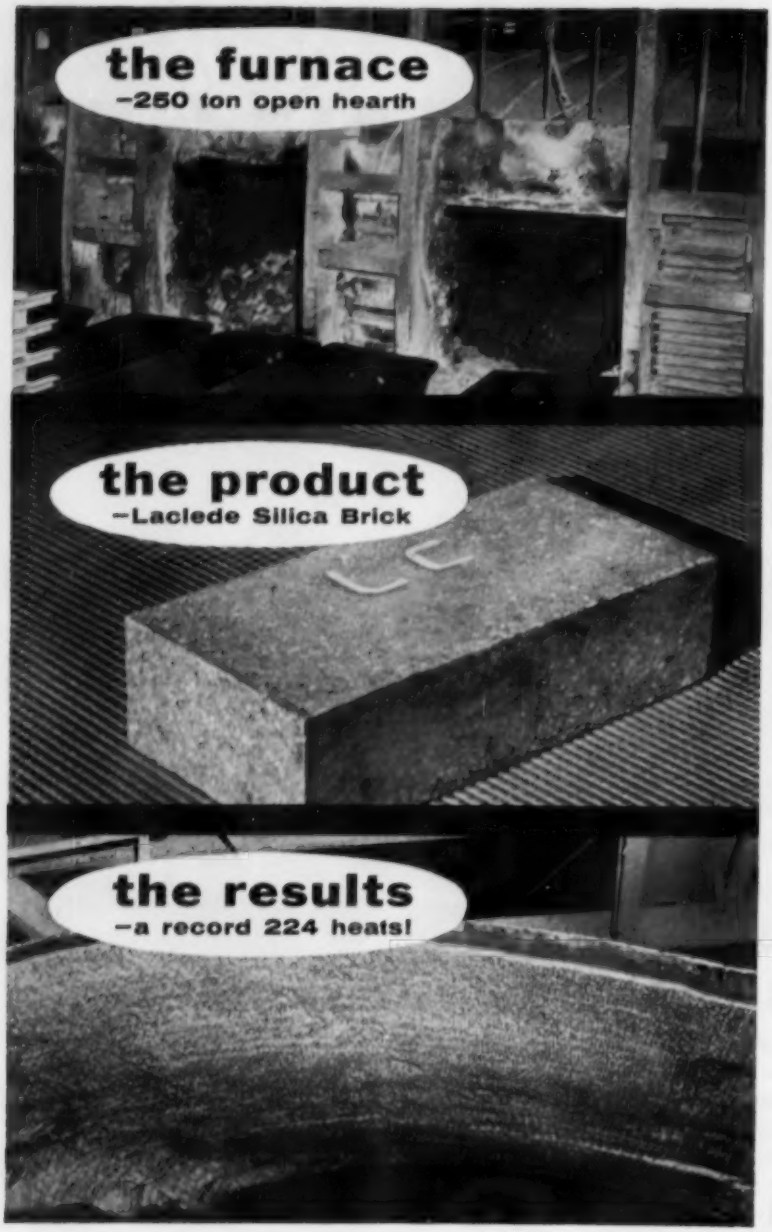
Geared to boost your earnings!

UNIT CRANE & SHOVEL CORP.
Milwaukee 14, Wisconsin

Please send me your new Bulletin on the UNIT CHALLENGER Model 510.

Name .....
Address .....
City .....
State .....

A 8502-1PC



LACLEDE-CHRISTY does it again!

What more can you ask? Laclede-Christy Silica Brick completed 224 heats in the roof of a 250 ton open hearth furnace at a leading midwest steel mill. Based on a year's average, Laclede-Christy out-lasted other silica brick by 27 to 67 heats—for an average savings of *at least* 30%!

Is this the kind of refractory service you're looking for? Your source of supply—Laclede-Christy—is nearby.

LACLEDE-CHRISTY COMPANY

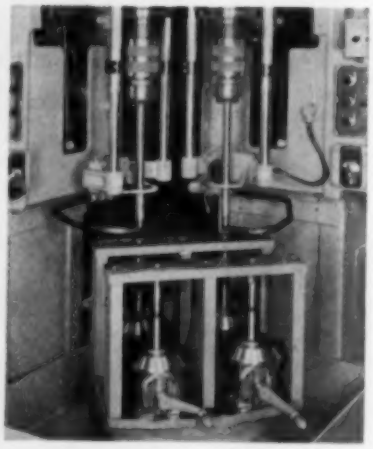
HKP

DIVISION OF H. K. PORTER COMPANY, INC.
2000 Hampton Avenue • St. Louis 10, Missouri
Mission 7-2400

LACLEDE CHRISTY COMPANY Quality First

actuated and speed is infinitely variable from 0 to about 60 sfm. Automatic rotary index table controls are interlocked with machine controls.

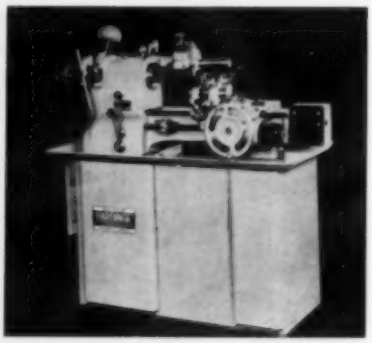
The four-station fixture makes it possible to hone two parts simultaneously while two stations are being unloaded and loaded. The



same procedure can be used with one-station indexing to hone the same bore progressively, or two different bores in the same part. Micromatic Hone Corp., 8100 Schoolcraft Ave., Detroit, Mich.

High-Speed Precision Chucking Machine

This late-model, HCT, high-speed, precision chucking machine has three-selector, variable speed drive.



Personnel will operate the machine under power at the ASTE exhibition to demonstrate its cost cutting features. Hardinge Bros. Inc., Elmira, N. Y.

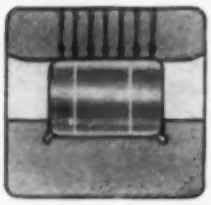
ROLLWAY

Tru-Rol

ROLLER BEARINGS

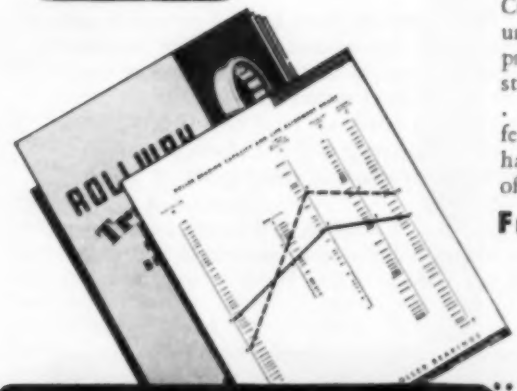
...up-to-the minute design... plus economy

All Tru-Rol Bearings Now Have



CROWNED ROLLERS . . .

Crowned Roller under full load — stress uniformly distributed.



• Proved in performance . . . proved for economy . . . unsurpassed for versatility . . . the Tru-Rol Bearing incorporates the design know-how accumulated through Rollway's many years of experience with all types of cylindrical roller bearings. Tru-Rol's features result in adaptability for any application requiring just the right balance between precision and economy.

• Designed for Versatility: Tru-Rol is available in all the inner and outer race combinations demanded by today's design. Crowned cylindrical rollers eliminate end loading—assure a uniform stress pattern along the *full length* of each roller, and prolong bearing life. Tru-Rol versatility offers a choice of stamped steel retainers with *guide lips*, or steel segmented retainers . . . both providing perfect alignment for every roller. These features have been quick to gain favor with engineers, and have led to the selection of Tru-Rol Bearings for a broad variety of applications.

Free! New Catalog . . .

36 pages of Valuable Information—Mail Coupon Today. The Tru-Rol Catalog includes all required data on every size, every type of Tru-Rol Bearings; complete description, ratings, dimensions—plus *extra* copies of the new Quick-Calculating Alignment Chart . . . a *graphic* solution of the *RBEC formula for bearing selection.

*Roller Bearing Engineers' Comm.—Anti-Friction Bearing Mfgs. Assn.

ROLLWAY BEARINGS

COMPLETE LINE OF RADIAL AND THRUST CYLINDRICAL ROLLER BEARINGS

ROLLWAY BEARING CO., INC.
545 Seymour St. • Syracuse 4, N. Y.

Please forward free copy of your new Tru-Rol Catalog with extra Alignment Charts.

Name_____ Title_____

Firm Name_____

Address_____

City_____ Zone____ State_____

ENGINEERING OFFICES: Syracuse • Boston • Chicago • Detroit • Toronto • Pittsburgh • Cleveland • Milwaukee • Seattle • Houston • Philadelphia • Los Angeles • San Francisco

Engineered and fabricated by Regal Plastic Company, Kansas City, Missouri.

Lightweight and Leakproof

Another Case for U.S. Royalite!

The Breuer Electric Manufacturing Company *had* the solution. All they needed was something to *hold* it in!

Something that would be unaffected by the shampoos and other chemical solutions used with their "Tornado" floor machines...

- ...that would be easy to fabricate and relatively inexpensive to produce.
- ...that would contribute to the modern appearance and efficiency of the machine.
- ...that *would not break or leak* when subjected to the rough use this powerful, versatile worker had to take.

All they needed was U. S. Royalite!

When they switched to U. S. Royalite for their solution tanks, they found it far less costly to fabricate than the formed metal previously used. And it *required no expensive finishing operations.* (The two halves are draw-formed separately, reinforced with bosses and flanges for threaded attachments, and liquid welded together. A transparent plastic inset shows fluid level.)

And though extremely light, this U. S. Royalite plastic tank is so rugged that it's brought *complete customer satisfaction in three years of grueling service.*

If you have a solution that needs a case, perhaps you *too* will find the answer in U. S. Royalite. Why not write to us and find out?

U.S. ROYALITE®
TOUGH, VERSATILE FABRICATING MATERIAL

US RUBBER

UNITED STATES RUBBER COMPANY
2638 NORTH PULASKI ROAD, CHICAGO 39, ILLINOIS

NEW literature

Write directly to the company for a copy

Vapor Degreasing

After an introduction on the principles of vapor degreasing, this booklet describes the solvent cycle, the vapor degreaser, vapor spray degreaser, liquid-liquid vapor degreaser and the Metalwash hydraulic lifter for batch type degreasers—12 pages. Metalwash Machinery Corp., 925 North Ave., Elizabeth 4, N. J.

Aluminum Cutter

This comprehensive engineering data book contains information on the H. K. Porter Inc. cutter being made from Frontier 40-E aluminum alloy. Frontier Bronze Corp., 4861 Packard Rd., Niagara Falls, N. Y.

Resin Coating

Complete product information, including specifications, estimating data and directions, is offered on Thick Coat. Assistance on corrosion problems is available on request. Pennsylvania Salt Mfg. Co., 1000 Widener Bldg., Philadelphia 7, Pa.

Industrial Television

This catalog describes ITV-6 industrial television equipment. It covers features, applications, construction details and specifications—catalog E.51, 4 pages. Radio Corp. of America, Engineering Products Div., Building 15-1, Camden 2, N. J.

Pickling Aids

"Houghton Pickling Inhibitors" describes two new pickling aids and an improved version of an established heavy-duty inhibitor. E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

Centralized Lubrication

This bulletin shows the advantages of Farval centralized lubrication for small machines or equipment which has a limited number of bearings—bulletin 16, 7 pages. Farval Corp., 3249 E. 80th St., Cleveland 4, O.

Drives

A complete engineering catalog is available on a new single-groove, wide-range, adjustable-speed drive. American Pulley Co., 4200 Wissahickon Ave., Philadelphia 29, Pa.

Pipe Fittings

This bulletin presents the dimensional specifications of 150-lb stainless steel fittings of the screw-end

You needn't be a gear engineer to use this new Reducer Catalog...

• BRAD FOOTE'S new Speed Reducer Catalog is easy to use. It contains simple instructions on how to choose and how to order. It tells you what job factors to consider and the reasons why. It eliminates the "mysteries" of speed reducer selection.

• Horsepower rating tables* and dimension charts are printed in large easy-to-read type. Pages are uncrowded and easy on the eyes. Every figure and every dimension can be located quickly. Complete index speeds finding the data you need. So do the index markers at the top of each page.

• In the new No. 120 Speed Reducer Catalog, BRAD FOOTE helps you choose the reducer you need from single, double or triple reduction parallel shaft, and double and triple reduction right angle types. It's as easy as A, B, C.

Write today for your free copy

*Conform to AGMA standards

BRAD FOOTE GEAR WORKS, INC.

1309 South Cicero Avenue • Cicero 50, Illinois
Bishop 2-1070 • OLympic 2-7700 • TWX: CIC-2856-U

subsidiaries

AMERICAN GEAR & MFG. CO.
Phone: Lemont 920
Lemont, Illinois

PITTSBURGH GEAR COMPANY
Phone: SPaulding 1-4600
Pittsburgh 25, Pennsylvania

NEW LITERATURE

and socket-welding types in sizes from ⅛ to 2 in. Fittings manufactured include 90 degree elbows, tees, 45 degree elbows, crosses, couplings, reducers, pipe caps, unions, plugs and bushings in type 304 and 316 stainless—S-3-55, 4 pages. H. K. Porter Company Inc., 342 Madison Ave., New York 17, N. Y.

Rotameters

Information offered on the Full-View Rotameters includes: Side plate construction and safety features, flow capacity charts, details of design and construction, dimensional drawings, tube and float material, design data and various modifications of standard meters—bulletin 115, 19 pages. Brooks Rotameter Co., Lansdale, Pa.

Industrial Castings

Absco Metal castings for industry are described. Characteristics of the material, properties, engineering information on hardenability, section strength and comparative properties of other cast metals are included—7 pages. American Brake Shoe Co., 230 Park Ave., New York 17, N. Y.

Sunny Magic Extends to Business and Industry, Too!

It's great to be in Florida for vacation. But it's greater to LIVE and make your living in Florida. Florida's sunny tax climate and strategic geographic location in relation to expanding U. S. and Latin-American markets permit business and industry to grow and prosper.

Most types of industry and business can find a happy, sunny home in Florida with sun-blessed living for workers and executives. Florida has manpower—2,629 new residents moving here from other states every week. Florida has power. Florida has abundant water. Florida has a tax structure exceedingly favorable to business and industry. In short, Florida has what you need!

To find out how well qualified Florida is for the site of your new plant, branch plant, office or warehouse, write State of Florida, Industrial Development Div., 3408 J Caldwell Building, Tallahassee, Florida for the NEW FREE FLORIDA INFORMATION KIT. It's file-size and contains separate folders, factually and accurately written, on the following aspects of Florida:

MARKET • NATURAL RESOURCES
EDUCATION & CULTURE • POWER
RESEARCH • HEALTH & CLIMATE
GOVERNMENT & TAXES • WATER
LABOR • TRANSPORTATION

Plan national sales conventions, sales conferences and state and regional meetings for Florida. Exceptional facilities for any type of meeting. Get double value . . . successful meetings in delightful surroundings plus colorful recreational activities.

you'll always do better in *Florida*

Carbide Tool Selection

To make selection easier, Carboloy engineers offer easy-to-use tables suggesting first and second choice carbide grades to machine various materials. Grades 350 and 370 are incorporated to show where they can be used most effectively in relation to other carbides. General Electric Co., Carboloy Department, Detroit 32, Mich.

Lock Washer Selection

This folder explains how a dome-type lock washer replaces a flat washer and separate lock washer. Savings are said to be in assembly time and materials cost. A free sample kit is offered—4 pages. Shakeproof Div., Illinois Tool Works, St. Charles Rd., Elgin, Ill.

Drives, Transmissions

Two catalogs cover Specon products. One is on the variable speed drive, the other, the variable speed transmission. Both have infinitely wide speed ranges—bulletins 120-B, 130-A. Fairchild Engine & Airplane Corp., Speed Control Div., St. Augustine, Fla.

Welded Polyethylene

"Quality Control for Welded Polyethylene" shows the availability and simplicity of certain key tests which enable fabricators to insure soundly constructed process equipment. American Agile Corp., P. O. Box 168, Bedford, Ohio.

Welding Supplies

This company's catalog covers its complete line of arc and oxyacetylene welding supplies and accessories—form ADC 848, 36 pages. Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.

Grinding Wheel Safety

Twenty simple safety precautions are given in "Safety Guide for Grinding Wheel Users"—4 pages. Grinding Wheel Institute, 2130 Keith Bldg., Cleveland 15, O.

Broaching Machine

The Colonial 4 Convertible, capable of horizontal pull broaching and vertical push and pull-down broaching and press work, is described with illustrations and schematic drawings—bulletin FW-55, 4 pages. Colonial Broach Co., Box 37, Harper Station, Detroit 13, Mich.

Drilling

Feed units, tapping units, hydraulic drill presses, index tables, fixed center and adjustable center drill heads are described. Information on multiple drilling applications is also

NEW LITERATURE

given—24 pages. Michigan Drill Head Co., P. O. Box 4643, Detroit 34, Mich.

AC Motors

"Check the Facts" points out 100 characteristics of the new line of totally protected ac motors. The booklet is intended to aid engineers and designers in checking design facts of this line—12 pages. Reliance Electric & Engineering Co., 1088 Ivanhoe Rd., Cleveland 10, O.

Vibrating Screens

A complete line of vibrating screens for all medium and heavy duty operations is covered. The book aids in the selection of a vibrating screen for a given material at a specific capacity—book 2554, 12 pages. Link-Belt Co., Dept. PR, 307 N. Michigan Ave., Chicago 1, Ill.

Electrodes

Mang-Trode electrodes are described in detail. They are for use in the metal-arc welding of manganese bronze and the yellow brasses without preheat—bulletin W-26. Ampco Metal Inc., 1745 S. 38th St., Milwaukee 46, Wis.

Tooling for Welding

This edition illustrates and describes standard and special tooling, fixtures and machinery for high-quality, high-speed, low-cost welding—40 pages. Cecil C. Peck Co., 14901 Woodworth Rd., Cleveland 10, O.

Rust Preventive

A special lubricating and rust preventing additive (Hydrolubric) for closed water hydraulic systems is explained. E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

Industrial Heating

The high-frequency motor-generator sets and associated apparatus discussed are designed for induction heating operations, such as hardening, annealing, brazing, forging and heat treating—bulletin 85-871, 8 pages. Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

Bolts

The design and properties of Place bolts are covered. The slotted-type heads are illustrated and a guide chart for average applications is included. Cleveland Cap Screw Co., 2917 E. 79th St., Cleveland 4, O.

Welded Tubing

This handbook covers the range of sizes, gages and tolerances on square, round and rectangular steel tubing and special cold-formed shapes. It includes physical properties, elements of sections and other data of value to engineers, designers and architects—32 pages. Van Huffel Tube Corp., Warren, O.

Tumbling Abrasive

"Borolon Tumbling Abrasive" describes aluminum oxide lumps and grain for barrel finishing a wide variety of parts and materials—4 pages. Simonds Abrasive Co., Tacony and Fraley Sts., Philadelphia 37, Pa.

Filter Facts

"Fundamentals of Filtration" details filtering equipment and its relation to the lubrication system, contaminants, filter materials, engine fuel, etc.—Filter Facts No. 1, 12 pages. Engine Life Products Corp., El Monte, Calif.

Trucks, Trailers

The complete line of "job-suited" trucks, trailers, casters and wheels for every industry is described—catalog 55. Thomas Truck & Caster Co., 600 Mississippi River, Keokuk, Iowa.

SPECIFICALLY ENGINEERED . . . NEVER MERELY ADAPTED . . .
FOR EACH PARTICULAR TYPE OF APPLICATION

HANSEN
QUICK-CONNECTIVE
COUPLINGS

ONE-WAY SHUT-OFF
Shuts off one side of line

Gives quick connection and disconnection, with instant automatic flow or shut-off. To connect Coupling, and open line to flow of fluid, merely push Plug into Socket. To disconnect, a slight pull on sleeve releases Plug and shuts off supply end of line.

TWO-WAY SHUT-OFF
Shuts off both sides of line

To connect, pull back sleeve and push Plug into Socket. Identical torpedo type valves permit free flow of gas or liquid through Coupling. To disconnect, pull back sleeve . . . Coupling immediately disconnects, valves automatically seal both ends of line. Female pipe thread connections from ⅛" to 1". Available in brass or steel.

STRAIGHT-THROUGH COUPLING

Provides quick connection and disconnection, but does not have shut-off feature. Sizes, ranging from ¼" to 2½", carried in stock. Two special types of straight-through steam Couplings also available—one for low pressures, and one for high pressures.

REPRESENTATIVES IN PRINCIPAL CITIES

Quick-Connective Fluid Line Couplings for
Oil • Hydraulic Fluids
Grease • Steam • Water
Refrigerants • Acetylene
Air • Oxygen • Vacuum
Gasoline • Coolants
Write for Catalog

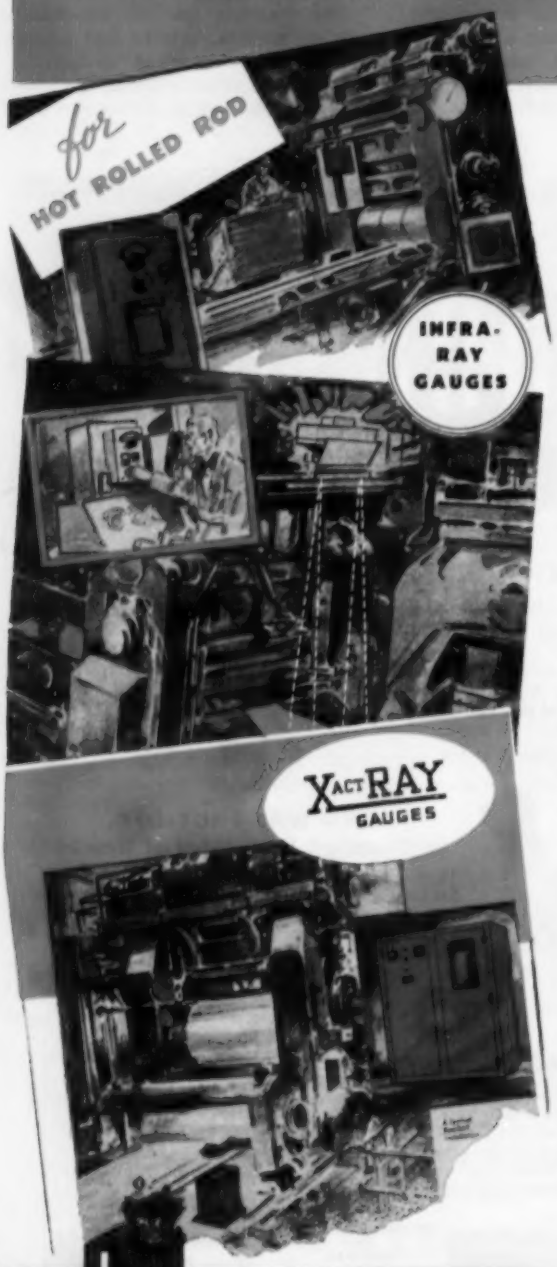
SINCE 1915 • QUICK-CONNECTIVE FLUID LINE COUPLINGS

THE HANSEN MANUFACTURING COMPANY

4031 WEST 150th STREET • CLEVELAND 11, OHIO

Cut Mill Costs

WITH MODERN NON-CONTACT GAUGES



HOT STRIP WIDTH

THE INFRA-RAY WIDTH GAUGE

A continuously indicating non-contact gauge operated by radiation from the material being measured—hot strip, plate, skelp, band, bar, shapes, or tubing.

On hot strip finishing stands it is not simply a width indicator. It provides a responsive method of making width by use of *controlled tension.*

This INFRA-RAY Width Gauge reduces trim scrap, avoids hold-back orders to replace a too-narrow coil, and holds mill edge material to closer tolerance.

HOT OR COLD STRIP THICKNESS

THE XactRAY THICKNESS GAUGE

An X-ray operated gauge for non-contact, accurate, continuous indication of strip thickness. A trouble-free, non-mechanical, simply-operated thickness gauge that can be adapted to any size or type of rolling mill and mounted close to the rolls.

THE XactRAYMATIC CONTROL

Electronic equipment for automatic strip thickness control—operated by the signal of the X-ray Gauge. Limits thickness deviation of strip from single stand mills or from the first stand of tandem mills by control of roll screw-down motors. Additional equipment can be provided to control thickness automatically by the same means used manually in the remaining stands, with no change of present mill controls.

This XactRAY Thickness Gauge permits you to accept orders with tolerances impossible to meet by hand control, increase speed of rolling, reduce scrap and returns.

HOT ROLLED ROD DIAMETER

THE INFRA-RAY DIAMETER GAUGE

For continuous measurement of the diameter of hot rolled wire rod as it emerges from the mill. The infra-red radiation of the rod itself supplies the operating signal to the gauge head which is mounted several feet from the rod.

This INFRA-RED Diameter Gauge will not only measure diameter continuously but will also detect lean rod, overfill, squashouts, and crossed rolls.

IGC **INDUSTRIAL GAUGES CORPORATION**

ENGLEWOOD, NEW JERSEY

Write for Details

STEEL
March 7, 1955

Market Outlook

STEEL DEMAND, already strong, will be even more vigorous over the next few weeks.

Not only will consumers be trying to get enough steel for their high rate of usage but they'll be strengthening their inventories. Here are three reasons: 1. Increased consumption requires a larger working inventory. 2. Because steel is harder to get, consumers want to have some extra tonnage on hand. 3. Consumers anticipating the possibility of a steel wage increase and an accompanying price rise will try to hedge against the latter.

DIFFERENT INCENTIVE—Inventory building in this case shouldn't go so far as it did during the war periods when no one knew how long it would be before demand eased. Inventory building probably wouldn't be necessary now if supplies hadn't been cut so low last year. That reduction was carried so far that the steel industry last year operated below the level of most steel consumers.

UP AND UP—The turnabout has been so pronounced that in the week ended Mar. 6 steel for ingots and castings was produced at the rate of 90.5 per cent of capacity. That's half a point over that of the preceding week. The rate has climbed each week this year. At 90.5 per cent, the industry is producing steel for ingots and castings at an annual rate of 113.8 million net tons. No year has seen that much output. The record was 111,609,719 tons in 1953.

SIGN OF THE TIMES— Evidence of the tightened demand for steel is the discontinuance by Republic Steel Corp. and Inland Steel Co. of their weekly steel availability lists. The job now is not so much one of selling as it is of producing.

Some people think that a letup in automotive steel buying will come around the end of May, either because of an autoworkers' strike or of a saturated auto market. Automakers are still buying. Ford Motor Co. declares its sales all this quarter have been well above expectations.

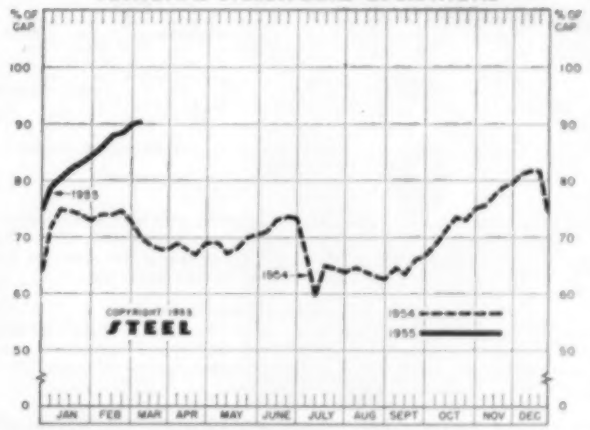
BROAD SUPPORT—Even if the automakers reduce their steel demands there still will be substantial demands from other consumers. The second largest user of steel—the construction industry—is shaking off the lethargy of winter and stepping forward into the steel market. Bookings of fabricated structural steel in January were 22 per cent over those of the preceding month. Pipeline projects are starting to take a good many plates, causing this product to move from a plentiful one to one of lengthened deliveries.

NEW LIFE—Other industries showing new strength are agricultural equipment and construction machinery. Even new life is coming into the listless steel rail market. Some railroads are releasing orders earlier and want deliveries faster than schedules originally set up.

The thing that gives promise of a substantial steel demand despite any decline from the auto industry is the wide base of demand. New orders are coming in increasing volume from almost every quarter.

ORE PRICES RISE— Iron ore, one of the raw materials of the iron and steel industry, is going to cost more. It rose 10 to 20 cents a gross ton, depending on the grade. Otherwise, prices were steady.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Mar. 6	Change	Same Week 1954	Same Week 1953
Pittsburgh	90	— 0.5*	81.5	107
Chicago	94	+ 1*	79.5	103.5
Mid-Atlantic	87	0	88	96
Youngstown	92	0	79	107
Wheeling	96	+ 2	83	101
Cleveland	94.5	+ 4.5	66	104
Buffalo	100	0	63.5	106.5
Birmingham	86.5	0	80	96
New England	80	—10	85	85
Cincinnati	85.5	— 1	72.5	101
St. Louis	96	— 6	43.5	96
Detroit	85	0	63.5	105
Western	94	+ 4	80.5	110.5
National Rate	90.5	+ 0.5	70	101

INGOT PRODUCTION‡

	Week Ended Mar. 6	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	135.2†	134.4	125.9	105.0
NET TONS (In thousands)	2,172†	2,191	2,070	1,686

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,413,275 in 1955; 2,384,549 in 1954; 2,254,459 in 1953.

Metalworking Outlook—p. 53 Technical Outlook—p. 101

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Mar. 1 1955	Feb. 22 1955	Month Ago	Feb. Average
(1947-1949=100)	144.7	144.7	144.7	144.7

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Mar. 1

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1	$4.525	Sheets, Electrical	$9.350
Rails, Light, 40 lb	5.917	Strip, C.R., Carbon	7.493
Tie Plates	5.275	Strip, C.R., Stainless, 430 (lb)	0.415
Axles, Railway	7.500	Strip, H.R., Carbon	5.113
Wheels, Freight Car, 33 in. (per wheel)	48.500	Pipe, Black, Buttweld (100 ft)	15.000
Plates, Carbon	4.675	Pipe, Galv. Buttweld (100 ft)	18.606
Structural Shapes	4.517	Pipe, Line (100 ft)	146.804
Bars, Tool Steel, Carbon (lb)	0.430	Casing, Oil Well, Carbon (100 ft)	154.216
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.525	Casing, Oil Well, Alloy (100 ft)	227.875
Bars, Tool Steel, H.R., Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.115	Tubes, Boiler (100 ft)	‡
Bars, Tool Steel, H.R., Alloy, High Speed W 18, Cr 4, V 1 (lb)	1.610	Tubing, Mechanical, Carbon	‡
Bars, H.R., Alloy	8.875	Tubing, Mechanical, Stainless, 304 (100 ft)	161.193
Bars, H.R., Stainless, 303 (lb)	0.423	Tin Plate, Hot-dipped, 1.25 lb	8.533
Bars, H.R., Carbon	5.000	Tin Plate, Electrolytic, 0.25 lb	7.233
Bars, Reinforcing	4.963	Black Plate, Canmaking Quality	6.333
Bars, C.F., Carbon	8.160	Wire, Drawn, Carbon	7.938
Bars, C.F., Alloy	11.375	Wire, Drawn, Stainless, 430 (lb)	0.545
Bars, C.F., Stainless, 302 (lb)	0.438	Bale Ties (bundle)	5.860
Sheets, H.R., Carbon	4.870	Nails, Wire, 8d Common	7.815
Sheets, C.R., Carbon	5.864	Wire, Barbed (80-rod spool)	7.097
Sheets, Galvanized	7.220	Woven Wire Fence (20-rod roll)	16.815
Sheets, C.R., Stainless, 302 (lb)	0.553		

‡Not available

STEEL's FINISHED STEEL PRICE INDEX*

	Mar. 2 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 avg.=100)	194.53	194.53	194.53	189.74	166.13
Index in cents per lb	5.270	5.270	5.270	5.140	4.230

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$117.82	$117.82	$117.82	$113.91	$93.18
No. 2 Fdry, Pig Iron, GT	56.54	56.64	56.54	56.54	46.47
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	45.97
Malleable Pig Iron, GT	57.27	57.27	57.27	57.27	47.27
Steelmaking Scrap, GT	37.33	37.33*	35.25	24.50	27.33

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130. *Revised

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Mar. 2 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.45
Bars, H.R., Chicago	4.30	4.30	4.30	4.15	3.45
Bars, H.R., deld. Philadelphia	4.55	4.55	4.55	5.302	3.93
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.20	4.10-4.15
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.10	3.40
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.40
Shapes, deld. Philadelphia	4.53	4.53	4.53	4.38	3.42
Plates, Pittsburgh	4.225	4.225	4.225	4.10	3.50
Plates, Chicago	4.225	4.225	4.225	4.10	3.50
Plates, Coatesville, Pa.	4.225	4.225	4.225	4.10	3.60
Plates, Sparrows Point, Md.	4.225	4.225	4.225	4.10	3.50
Plates, Claymont, Del.	4.225	4.225	4.225	4.10	3.60
Sheets, H.R., Pittsburgh	4.05	4.05	4.05	3.925	3.35
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.35
Sheets, C.R., Pittsburgh	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Chicago	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Detroit	5.10	5.10	5.10	4.975	4.30
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.275	4.40
Strip, H.R., Pitts.	4.05	4.05	4.05	4.425	3.25
Strip, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.45	4.15
Strip, C.R., Chicago	5.85	5.85	5.85	5.70	4.30
Strip, C.R., Detroit	5.90	5.90	5.90	5.45-6.05	4.25-.40
Wire, Basic, Pitts.	5.75	5.75	5.75	5.525	4.50
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.55	5.30
Tin Plate (1.50 lb), box, Pitts.	$9.05	$9.05	$9.05	$8.96	$7.50

SEMIFINISHED STEEL

Billets, Forging, Pitts. (NT)	$78.00	$78.00	$78.00	$75.50	$63.00
Wire Rods, $\frac{5}{32}$-$\frac{9}{32}$" Pitts.	4.675	4.675	4.675	4.525	3.85

PIG IRON, Gross Ton

Bessemer, Pitts.	$57.00	$57.00	$57.00	$57.00	$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	59.66	59.66	59.66	59.66	49.44
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, deld. Phila.	55.16	55.16	55.16	60.16	49.94
No. 2 Fdry, Birm.	52.88	52.88	52.88	52.88	42.38
No. 2 Fdry (Birm.) deld. Cin.	60.58	60.58	60.58	60.43	49.08
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne	190.00†	190.00†	190.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$38.50	$38.50	$35.75	$25.50	$31.00
No. 1 Heavy Melt, E. Pa.	39.50	39.50	36.00	23.00	23.50
No. 1 Heavy Melt, Chicago	34.00	34.00	34.00	25.00	27.50
No. 1 Heavy Melt, Valley	37.50	37.50	36.50	23.50	31.25
No. 1 Heavy Melt, Cleve.	34.00	34.00	33.50	20.50	28.25
No. 1 Heavy Melt, Buffalo	32.50	32.50	30.50	25.00	28.25
Rails, Rerolling, Chicago	49.50	49.50	49.50	36.50	40.50
No. 1 Cast, Chicago	40.00	40.00	40.00	30.50	41.00

COKE, Net Ton

Beehive, Furn, Connisvl.	$13.75	$13.75	$13.75	$14.75	$13.25
Beehive, Fdry, Connisvl.	16.75	16.75	16.75	16.75	15.50
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	21.00

Daily Nonferrous Price Record

	Price Mar. 2	Last Change	Previous Price	Feb Avg.	Jan. Avg.	Mar. 1954 Avg.
Copper	33.00	Jan. 28, 1955	30.00	33.000	30.180	29.865
Lead	14.80	Oct. 4, 1954	14.55	14.800	14.800	12.735
Zinc	11.50	Sept. 3, 1954	11.00	11.500	11.500	9.657
Tin	91.125	Mar. 2, 1955	91.00	90.908	87.280	92.518
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	60.000
Aluminum	23.20	Jan. 13, 1955	22.20	23.200	22.900	21.500
Magnesium	27.00	Mar. 9, 1953	24.50	27.000	27.000	27.000

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99+%, deld.; MAGNESIUM, 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.** Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.** Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.** Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.** Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**

How Harvey puts aluminum to work for you...

Here are a few of the many ways Harvey makes your product easier to manufacture, easier to sell

EXTRUSIONS... For decorative as well as basic parts, custom-designed aluminum extrusions replace riveted and welded assemblies... simultaneously increase strength and simplify fabrication.

STRUCTURALS... High strength, light weight, workability, corrosion resistance. Aluminum extrusions combine all four... are ideal as basic load-bearing members.

MACHINING STOCK... Harvey deep-drawn hex and round stock set a new mark in uniform grain structure—consistent from surface to core. This means fast, chatter-free cutting, long tool life, few rejects and true threads.

FORGING STOCK... If you make your own forgings in quantity, Harvey extruded forging stock can save many intermediate steps. Custom-designed extrusions whose cross sections approximate the forged blanks may be cut to length.

EXTRUDED PIPE AND TUBE... Seamless... uniform in structure, size and shape... clean and smooth inside and out... easily formed. Usable in applications ranging from portable irrigation systems to aircraft heat exchangers.

DRAWN TUBE... Combines strength and high finish... ideal for TV antennas, furniture, and similar products. Cold drawn for structural uniformity ... temper specially controlled for workability.

PRESS FORGINGS... Where parts must combine maximum strength with savings in weight, cost and manpower, Harvey aluminum forgings often completely solve a designer's problem.

IMPACT EXTRUSIONS... Thin-walled, tubular structures can be produced by this method and held to very close tolerances. Machining is practically eliminated, and scrap is greatly reduced.

AUTOMATIC SCREW MACHINE PRODUCTS... The West's largest installation of multiple-spindle screw machines can reduce your manufacturing costs. Harvey carries your job through every step—from engineering through quality control.

Forty years of solving the special and difficult design problems of industry have developed the "practical imagination" that characterizes the entire Harvey approach. Our Field Engineers will gladly sit down with your own designers to determine in detail how Harvey's experience can put aluminum to work making *your* product easier to manufacture, easier to sell.

MAKING THE MOST OF ALUMINUM... FOR EVERYONE

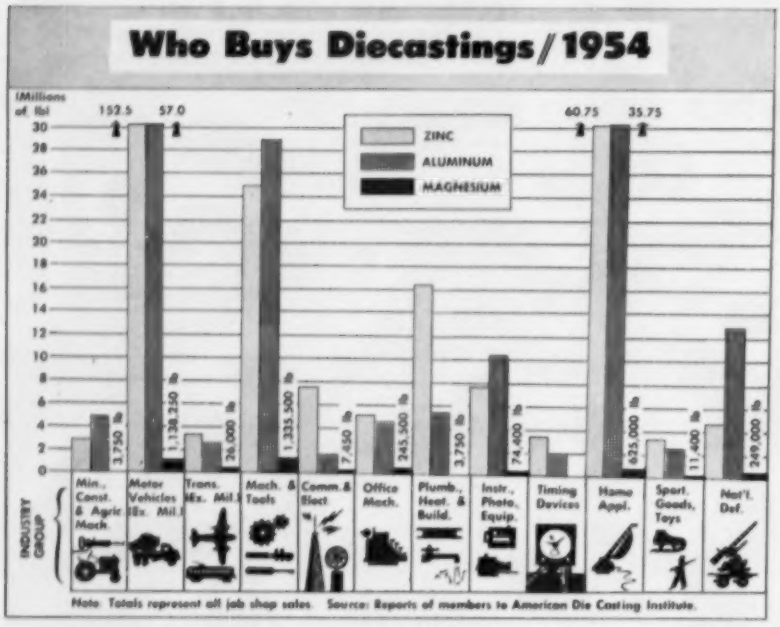
HARVEY Aluminum

HARVEY ALUMINUM SALES, INC., TORRANCE, CALIFORNIA
BRANCH OFFICES IN PRINCIPAL CITIES

SEE MODEL OF HARVEY'S NEW 12,000 TON EXTRUSION PRESS AT WESTERN METALS EXPOSITION, BOOTH #302.

RESEARCH... DEVELOPMENT... PRODUCTION... *Harvey does all three as a leading independent producer of aluminum extrusions in all alloys and all sizes, special extrusions, press forgings, hollow sections, structurals, rod and bar, forging stock, pipe, tubes, impact extrusions, aluminum screw machine products and related products. Also similar products in alloy steel and titanium on application.*

Nonferrous Metals



Die casters anticipate record sales of $400 million this year. Increased use of zinc in automobiles is big reason. Aluminum also shares in prosperity

Nonferrous Metal Prices, Pages, 162 & 163

RECORDS undoubtedly will fall in American industry this year, but few will be shattered as completely as the one in die castings. This year, the American Die Casting Institute predicts sales will reach above the $400-million mark, a whopping 49 per cent over the $268-million business done by job shops in 1954. The new mark will be substantially ahead of the previous high of about $320 million in 1953.

Following the tempo of motordom, the industry bases its optimism on the record rate of automotive production for the first six months. That pace will not be maintained over the year, but even an autoworkers' strike will not offset the gains registered in first half, most industry men believe.

Lion's Share—The graph above shows clearly that motor vehicles take the lion's share of all die castings, and that share is growing as more automakers turn to zinc and aluminum die castings. A survey by ADCI and the American Zinc Institute shows that this year 16 different models have complete die cast grilles and another 6 have major die cast components up front. Consumption of zinc in such applications ranges all the way from Packard's 39.93 lb per car to Ford's 3.5 lb, with most models in the 20-lb class.

Typical of the trend is Chrysler Corp., which last year used no zinc at all in grille treatment. This year, the corporation's full line of cars has gone over to that metal. AZI predicts the trend will continue in next year's models, promising even greater use of zinc. But the front end of the cars is not the only place where die castings are finding greater use. ADCI says door handles are entirely die cast—about 76 million of them were produced in a period of 110 working days alone.

Lightweight Factor — Aluminum, besides picking up weight in the automotive field, is also gaining new uses in office machinery and home appliances. Its light weight is the big factor in its favor for these applications.

Brass, restricted in this field because of its higher melting point, may become more important to the industry as the result of present research by the American Die Casting Institute. But its tonnage for such uses last year—6.6 million lb—was a minute portion of the whole. Magnesium was even more negligible, but its light weight and outstanding performance in aircraft applications augur well for it in this industry.

Zinc, Aluminum Feel Effects

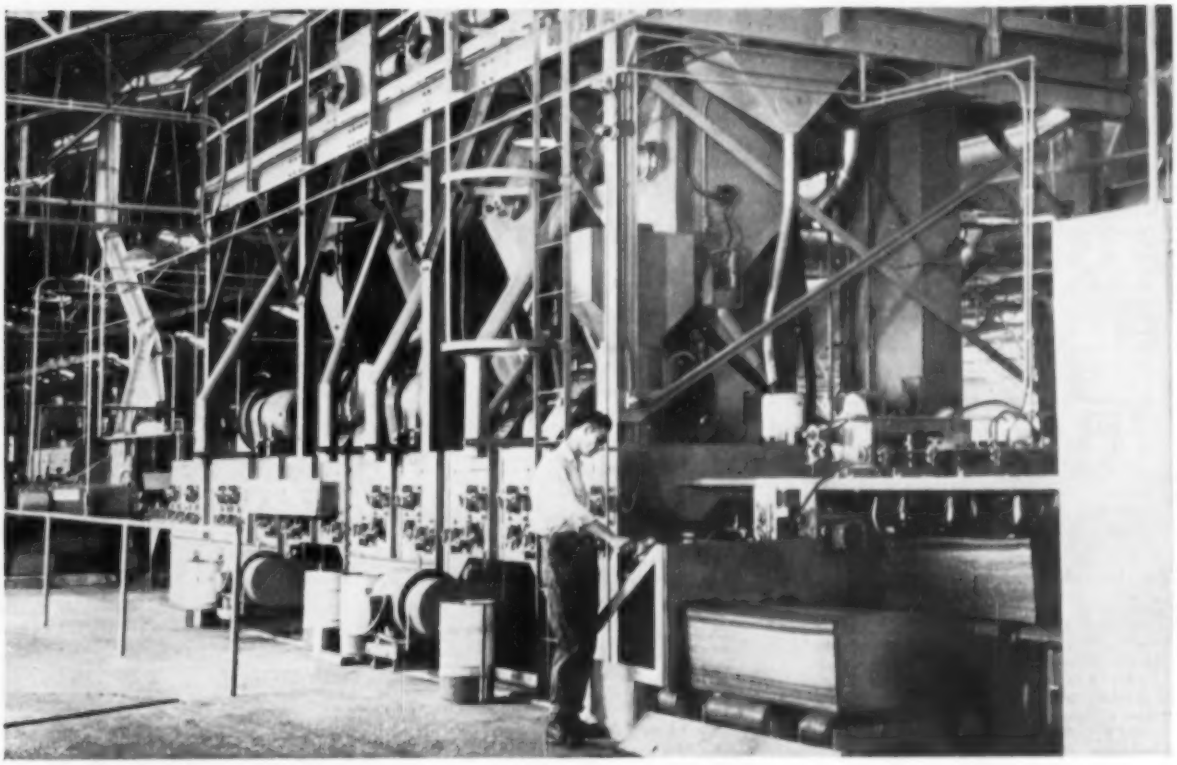
This spurt in die castings is exerting its share of influence on the metal supply picture. It is helping to cut down zinc stocks, accounting for more than 38 per cent of the nation's slab zinc production last year. This year, the industry will take about 280,000 tons of zinc. It's an academic question whether price stability has influenced greater use of zinc die castings or vice versa. It's probably a reciprocal action, with a big assist from the government stockpile.

As for aluminum, die castings accounted for 42 per cent of U. S. aluminum casting ingot capacity in 1954, and the supply situation is coming in for sharper scrutiny. In 1955, about 275 million lb of aluminum will go into die castings. A combination of heavy government stockpiling and increasing exports has die casters worried. They are beginning to take metal at any price, and the spread in price is pretty wide. Primary ingots are now 23.20 cents a pound while secondary ingot has skyrocketed as high as 33 cents, depending on grade and type. That's the reverse of the usual price pattern and is resulting in a shift of some buyers from secondary to primary—if they can get it. But that doesn't have much effect on secondary availability, inasmuch as those producers are having trouble getting scrap. In 1953, aluminum scrap exports were 9 million lb. Last year the figure was 72 million lb. All of which worries not only die casters but also all users of aluminum.

Market Memos

- Copper users are wondering how much their problems will be eased with the release of 8000 tons of the metal from Defense Production Act inventory. This and additional cutbacks in export quotas for second quarter should help out, but the squeeze in copper will probably be with us until spring.
- January was the best sales month in over a year for lead. Good business will continue through the second quarter, with the third-quarter pegged to battery production. It should pick up from the same period last year.

pioneering developments keep WHEELABRATOR® first in blast cleaning



How WHEELABRATOR® MECHANICAL CLEANING

of Hot Rolled Steel Sheets Reduces Cleaning Costs per ton.

Operating results of airless Wheelabrator mechanical cleaning equipment for removing scale from hot rolled steel sheets have proved that other methods do not equal its cost-cutting performance and high speed cleaning efficiency.

In each of the seven drum plants of Rheem Manufacturing Co., for example, Wheelabrator machines have greatly reduced the cost of cleaning 18-gauge steel sheets used in the manufacture of their new Rheemcote lithographed steel drums. In other steel processing plants and steel mills, the Wheelabrator is also effecting impressive results in low cost, high production and providing extra benefits in improved surface cleanliness and better working conditions.

These production economies are a result of perfected equipment design coupled with the controlled abrasive blast of the Wheelabrator unit. With the introduction of Wheelabrator Steel Shot, equipment operating and maintenance costs are extremely low and continuous, high-production mechanical cleaning of hot rolled products is now in actual practice.

We would be glad to demonstrate the savings the Wheelabrator can make for you. Write today for full details and an appointment to see the Wheelabrator in operation.

Send today for Bulletin No. 894 "How to Descale Steel Strip Mechanically"

American
WHEELABRATOR & EQUIPMENT CORP.
509 S. Byrkit St., Mishawaka, Ind.

Wheelabrator®
AIRLESS BLAST CLEANING

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 90 + %, ingots 23.20, pigs 21.50, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 25.00; No. 43, 5% Si, 24.80; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 26.20; No. 195, 4.5% Cu, 0.8% Si, 25.50; No. 214, 3.8% Mg, 26.20; No. 356, 7% Si, 0.3% Mg, 24.90.

Antimony: R.M.M. brand, 99.5%, 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb, deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $118.30 per lb, nom.

Copper: Electrolytic 33.00 deld. Conn. Valley, 33.00 deld. Midwest; Lake 33.00 deld; Fire refined 32.75 deld.

Germanium: 99.9%, $294.84 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $90-$120 nom. per troy oz.

Lead: Common 14.80, chemical 14.90, corroding 14.90, St. Louis; N. Y. basis, add 0.20.

Lithium: 98%, $10-$14 per lb, depending on quantity.

Magnesium: 99.8%, self-palletizing pig 27.00; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks 1.3 in. diameter, 46.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more, f.o.b. Freeport, Tex., or Madison, Ill. Add 1.20 for Port Newark, N. J.

Mercury: Open market, spot, New York, $322-$324, per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3-$3.25 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 64.50; 10-lb pigs, unpacked 67.65; "XX" nickel shot 69.00; "P" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $120-$130, nom., per troy oz.

Palladium: $17-$20 per troy oz.

Platinum: $76-$80 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$56 per troy oz.

Selenium: 99.5%, $6-$7.25 per lb.

Silver: Open market, 85.25 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Sheet, rod $68.70 per lb; powder $40.20 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot 91.125, prompt 91.125.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max) $4.50, grade A-3 (0.5% Fe max) $4 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots $4.35-$4.40 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99+% hydrogen reduced, $4.65. Treated ingots $6.70.

Zinc: Prime Western 11.50, brass special 11.75, intermediate 12.00, E. St. Louis, freight allowed over 0.50 per pound. High grade 12.85, special high grade 13.00, die casting alloy ingot 16.50, deld.

Zirconium: Sponge $10 per lb; powder electronics grade $15, flash grade $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloy 29.00-31.75; No. 12 foundry alloy (No. 2 grade) 28.50-30.50; 5% silicon alloy, 0.60 Cu max, 30.25-32.00; 13 alloy, 0.60 Cu max, 30.25-32.00; 195 alloy 29.75-33.00; 108 alloy 29.00-31.00; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 30.50-32.50; grade 2, 29.50-31.50; grade 3, 28.50-30.50; grade 4, 27.50-29.50.

Brass Ingot: Red brass No. 115, 34.00; tin bronze No. 225, 45.50; No. 245, 39.25; high-leaded tin bronze No. 305, 38.00; No. 1 yellow, No. 405, 29.75; manganese bronze No. 421, 32.25.

Magnesium Alloy Ingot: AZ63A, 31.00; AZ91B, 26.00; AZ91C, 31.00; AZ92A, 31.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.71; rod, bar, wire, $1.68.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000-lb lots, 38.35; 30,000-lb lots, 38.48; l.c.l. 38.95. Weatherproof, 100,000 lb, 38.53; 30,000 lb, 38.78; l.c.l. 39.28. Magnet wire deld., 15,000 lb or more 44.99; l.c.l. 45.74.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more $20 per cwt; pipe, full coils $20 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forging billets, $9; hot-rolled and forged bars, $9.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets 23.60, ribbon zinc in coils, 19.00-20.50; plates 18.00-22.25.

ZIRCONIUM

Plate $27; H.R. strip $28; C.R. strip $35; forged or H.R. bars $27; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	102	78	99
Strip, C.R.	102	87	125
Plate, H.R.	97	82	95
Rod, Shapes H.R.	87	69	93
Rod, Shapes C.R.	91	75	115
Seamless Tubes	122	108	153
Shot, Blocks		65	

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	63.5	62.0	...	...
0.156-0.172	53.9	52.3	...	...
0.188	53.9	52.3	...	66.8
0.219-0.234	51.1	49.5	...	...
0.250-0.281	51.1	49.5	...	63.7
0.313	51.1	49.5	...	60.8
Cold-finished				
0.375-0.547	49.9	47.5	59.8	57.2
0.563-0.625	49.9	47.5	54.9	53.7
0.750-1.000	48.7	46.3	52.1	50.6
1.063	48.7	46.3	...	48.9
1.125-1.500	46.9	44.6	50.4	48.9
Rolled				
1.563	45.7	43.4	...	...
1.625-2.000	45.1	42.8	...	47.2
2.125-2.500	44.0	41.7	...	...
2.563-3.375	42.7	40.5	...	...

ALUMINUM

Sheets and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed over 499 lb)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circles†
0.249-0.136	35.9	40.4	...	...
0.135-0.096	36.4	41.3	...	...
0.095-0.077	37.1	42.3	34.6	39.6
0.076-0.061	37.7	43.2	34.8	39.8
0.060-0.048	38.2	43.6	35.1	40.2
0.047-0.038	38.7	44.5	35.6	40.6
0.037-0.030	39.1	45.0	36.0	41.3
0.029-0.024	39.7	45.5	36.3	41.8
0.023-0.019	40.4	46.9	37.1	42.6
0.018-0.017	41.2	...	37.7	43.5
0.016-0.015	42.1	...	38.5	44.7
0.014	43.1	...	39.5	46.0
0.013-0.012	44.3	...	40.2	47.0
0.011	45.3	...	41.4	48.6
0.010-0.0095	46.5	...	42.5	50.2
0.009-0.0085	47.8	...	44.0	52.3
0.008-0.0075	49.4	...	45.2	54.1
0.007	50.9	...	46.7	56.4
0.006	52.5	...	48.1	61.4

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in 24-60 in. width or diam, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	34.6	38.8
5050-F	35.7	39.9
3004-F	36.7	41.6
5052-F	38.4	43.4
6061-T6	39.6	44.0
2024-T4*	41.8	47.9
7075-T6*	49.6	56.2

*24-48 in. widths or diam, 72-180 in. lengths

ALUMINUM

Forging Stock: Round, Class 1, 47.80-37.30, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 53.60-41.00 in random lengths, 0.375-4 in. thick, widths 0.750-10 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20-ft length, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$16.10	2	$ 49.55
1	25.35	4	136.65
1¼	34.30	6	244.90
1½	41.00	8	368.50

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 94.00, 0.064-in. 73.00, 0.125-in. 60.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 53.00, 20,000 lb or more, 0.250-in. and over widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in 67.00. Channels, 5 in. 67.80. I-Beams, 5 in 66.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings 18.00-18.50; old sheet 15.50-16.00; borings and turnings 9.50-10.00; crankcases 15.50-16.00; industrial castings 15.50-16.00.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	51.76b	49.36	....	51.82	29.000	29.000	28.250
Yellow Brass	44.27	44.21	44.81	47.18	21.875	21.625	20.125
Red Brass, 85%	48.44	45.38	48.98	51.25	25.500	25.250	24.750
Low Brass, 80%	47.35	47.29	47.89	50.16	24.625	24.375	23.875
Naval Brass	48.18	42.49	56.24	51.34	20.250	20.000	19.500
Com. Bronze, 90%	50.08	50.02	50.62	52.64	28.625	28.375	25.875
Nickel Silver, 10%	58.25	62.25	60.58	....	26.000	25.750	13.000
Phos. Bronze, A, 5%	70.12	70.62	70.62	71.80	29.375	29.125	28.125
Silicon Bronze	55.94	55.13	55.98	57.56e	28.000	27.750	27.000
Manganese Bronze	51.92	46.02	56.48	....	20.375	20.125	19.500
Muntz Metal	46.34	42.15	....	....	20.625	20.375	19.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: Heavy copper and wire No. 1 30.00-30.50; No. 2 copper 29.00-29.50; light copper 26.50-27.50; No. 1 composition red brass 24.00-24.50; No. 1 composition turnings 23.00-24.00; yellow brass turnings 16.00-16.50; new brass clippings 20.50-22.00; No. 1 brass rod turnings 17.50-19.00; light brass 14.50-15.00; heavy yellow brass 16.00-18.50; new brass rod ends 18.50-20.00; auto radiators, unsweated 18.50-19.50; cocks and faucets 19.50-20.50; brass pipe 19.50-20.50.
Lead: Heavy 11.50-11.75; battery plate 6.00-6.75; linotype and stereotype 13.50-14.50; electrotype 12.00-12.50; mixed babbitt 12.00-14.00.
Magnesium: Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 15.50-16.50.
Monel: Clippings 28.00-35.00; old sheet 26.00-33.00; turnings 21.00; rods 28.00-35.00.
Nickel: Sheets and clips 55.00-60.00; rolled anodes 57.00-65.00; turnings 40.00-45.00; rod ends 57.00-65.00.
Tin: No. 1 pewter 50.00-55.00; block tin pipe 70.00-75.00; No. 1 babbitt 45.00-48.00.
Zinc: Old zinc 4.75-5.50; new die cast scrap 4.75-5.00; old die cast scrap 3.25-3.50.

REFINERS' BUYING PRICES
(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings 21.00-23.00; 3003 clippings 21.00-22.50; 6151 clippings 21.00-22.50; 5052 clippings 21.00-23.00; 2014 clippings 20.00-22.00; 2017 clippings 20.00-22.00; 2024 clippings 20.00-22.00; mixed clippings 20.00-21.00; old sheet 18.50-20.00; old cast 18.50-20.00; clean old cable (free of steel) 21.00-22.00; borings and turnings 18.50-20.50.
Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 45.00; light scrap 40.00.
Copper, Brass: No. 1 copper 33.50; No. 2 copper 32.00; light copper 30.25-30.50; refinery brass (60% copper) per dry copper content 28.00-28.50.

INGOTMAKERS' BUYING PRICES
(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 30.50-31.50; No. 2 copper 29.00-30.00; light copper 27.50-28.00; No. 1 composition borings 26.00-26.75; No. 1 composition solids 26.50-27.00; heavy yellow brass solids 21.00-21.50; yellow brass turnings 20.00; radiators 21.50-22.25.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

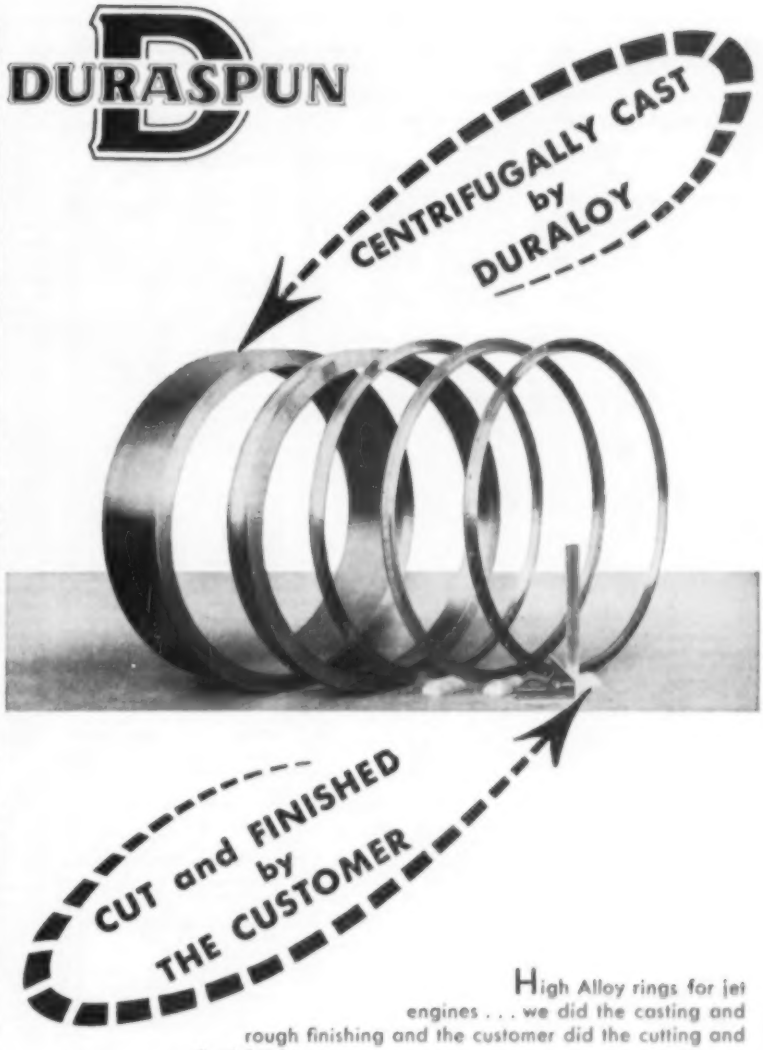
ANODES

Cadmium: Special or patented shapes $1.70 per lb.
Copper: Flat-rolled 48.42, oval 47.92, 5000-10,000 lb; electrodeposited 42.78, cast 45.04, 2000-5000-lb lots.
Nickel: Depolarized, less than 100 lb $1.015; 100-499 lb 99.50; 500-4999 lb 95.50; 5000-29,999 lb 93.50; 30,000 lb 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery effective Jan. 1, 1955.
Tin: Bar or slab, less than 200 lb $1.095; 200-499 lb $1.08; 500-999 lb $1.075; 1000 lb or more $1.07.
Zinc: Bar 20.00, bar or flat top 19.00, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100-lb drums.
Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.
Copper Cyanide: 100 lb 71.80; 200 lb 71.05; 300 lb 70.80; 400-900 lb 70.05; 1000 lb and over 68.05, effective Feb. 11, 1955.
Copper Sulphate: Crystal, 100 lb 20.50; 200 lb 17.50; 300 lb 16.50; 400 lb 16.00; 500-1900 lb 14.50; 2000 to 10,000 lb 14.25; 10,000 lb and up 14.15. Powder, add 0.5 to above prices. Effective Jan. 31, 1955.
Nickel Chloride: 100 lb 46.50; 200 lb 44.50; 300 lb 43.50; 400-4900 lb 41.50; 5000-9900 lb 39.50; 10,000 lb and over 38.50. All prices eastern delivery, effective Jan. 1, 1955.
Nickel Sulphate: 100 lb 38.25; 200 lb 36.25; 300 lb 35.25; 400-4900 lb 33.25; 5000-35,900 lb 31.25; 36,000 lb 30.25. All prices eastern delivery, effective Jan. 1, 1955.
Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.
Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.
Sodium Stannate: Less than 100 lb 70.10; 100-600 lb 55.90; 700-1900 lb 53.40; 2000-9900 lb 51.70; 10,000 lb or more 50.60.
Stannous Chloride (Anhydrous): Less than 50 lb $1.558; 50 lb $1.218, 100-300 lb $1.068, 400-900 lb $1.043; 1000-1900 lb $1.019; 2000-4900 lb 98.20; 5000-19,900 lb 92.10, 20,000 lb and over 86.00.
Stannous Sulphate: Less than 5 lb $1.258; 50 lb 95.80; 100-1900 lb 93.80; 2000 lb and over 91.80.
Zinc Cyanide: Under 1000 lb 54.30; 1000 lb and over 52.30.

DURASPUN



High Alloy rings for jet engines . . . we did the casting and rough finishing and the customer did the cutting and final finishing.

Centrifugally cast metal gives an exceptionally fine, dense, uniform grain structure. The strength of the metal approaches that imparted to a bar or ingot when it is hot forged. It produces an ideal metal for the tough service required of jet engine parts.

Incidentally, as evidence of our knowledge of and experience with tough alloy castings — static as well as centrifugal — the records show very few rejections by this engine manufacturer who subjected each of the many rings we furnished to his own very rigid tests.

May we suggest that you let Duraloy work on your high alloy castings — chrome iron, chrome nickel or nickel chrome? We have the experience and facilities for turning out high quality castings.

THE DURALOY COMPANY
OFFICE AND PLANT: Scottdale, Pa.
EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.
DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.
CHICAGO OFFICE: 332 South Michigan Avenue

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company. Key on page 165. Key to footnotes, page 167.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 .....$61.50

INGOTS, Alloy (NT)
Detroit R7 .....$65.00
Houston S5 .....70.00
Midland,Pa. C18 .....65.00
Munhall,Pa. U5 .....65.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)
Aliquippa,Pa. J5 ....$64.00
Bessemer,Pa. U5 .....64.00
Bridgeport,Conn. N19 ..69.00
Buffalo R2 .....64.00
Clairton,Pa. U5 .....64.00
Engley,Ala. T2 .....64.00
Fairfield,Ala. T2 .....64.00
Fontana,Calif. K1 ....73.00
Gary,Ind. U5 .....64.00
Johnstown,Pa. B2 .....64.00
Lackawanna,N.Y. B2..64.00
Munhall,Pa. U5 .....64.00
Pittsburgh J5 .....64.00
So.Chicago,Ill. R2, U5..64.00
So.Duquesne,Pa. U5 ...64.00
Youngstown R2 .....64.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$78.00
Bessemer,Pa. U5 .....78.00
Bridgeport,Conn. N19 ..83.00
Buffalo R2 .....78.00
Canton,O. R2 .....80.00
Clairton,Pa. U5 .....78.00
Conshohocken,Pa. A3 ..83.00
Engley,Ala. T2 .....78.00
Fairfield,Ala. T2 .....78.00
Fontana,Calif. K1 ....86.00
Gary,Ind. U5 .....78.00
Geneva,Utah C11 .....78.00
Houston S5 .....83.00
Johnstown,Pa. B2 .....78.00
Lackawanna,N.Y. B2 ..78.00
LosAngeles B3 .....87.50
Midland,Pa. C18 .....78.00
Munhall,Pa. U5 .....78.00
Pittsburgh J5 .....78.00
Seattle B3 .....91.50
So.Chicago R2,U5,W14..78.00
So.Duquesne,Pa. U5 ...78.00
So.SanFrancisco B3 ...87.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$86.00
Buffalo R2 .....86.00
Canton,O. R2, T7 ....86.00
Conshohocken,Pa. A3 ..93.00
Detroit R7 .....86.00
Fontana,Calif. K1 ....105.00
Gary,Ind. U5 .....86.00
Houston S5 .....91.00
Ind.Harbor,Ind. Y1 ...86.00
Johnstown,Pa. B2 .....86.00
Lackawanna,N.Y. B2..86.00
LosAngeles B3 .....106.00
Massillon,O. R2 .....86.00
Midland,Pa. C18 .....86.00
Munhall,Pa. U5 .....86.00
So.Chicago, R2,U5,W14..86.00
So.Duquesne,Pa. U5 ...86.00
Struthers,O. Y1 .....86.00
Warren,O. C17 .....86.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$96.50
Canton,O. R2 .....96.50
Cleveland R2 .....96.50
Gary,Ind. U5 .....96.50
So.Chicago R2, W14 ..96.50
So.Duquesne,Pa. U5 ...96.50

SKELP
Aliquippa,Pa. J5 .....4.00
Fontana,Calif. K1 ....4.775
Munhall,Pa. U5 .....3.90
SparrowsPoint,Md. B2..3.90
Warren,O. R2 .....3.90
Youngstown R2, U5 ....3.90

WIRE RODS
AlabamaCity,Ala. R2 ..4.675
Aliquippa,Pa. J5 .....4.675
Alton,Ill. L1 .....4.85
Buffalo B11, W12 ....4.675
Cleveland A7 .....4.675
Donora,Pa. A7 .....4.675
Fairfield,Ala. T2 .....4.675
Fontana,Calif. K1 ....5.475
Houston S5 .....4.925
IndianaHarbor,Ind. Y1 .4.675
Johnstown,Pa. B2 .....4.675
Joliet,Ill. A7 .....4.675
KansasCity,Mo. S6 ....4.925
Kokomo,Ind. C16 .....4.775
LosAngeles B3 .....5.475
Minnequa,Colo. C10 ..4.925
Monessen,Pa. P7 .....4.675
No.Tonawanda,N.Y.B11 4.675
Pittsburg,Calif. C11 ...5.325
Portsmouth P12 .....4.675
Roebling,N.J. R5 .....4.775
So.Chicago,Ill. R2 ....4.675
SparrowsPoint,Md. B2..4.775
Sterling,Ill.(1) N15 ....4.675
Sterling,Ill. N15 .....4.775
Struthers,O. Y1 .....4.675
Torrance,Calif. C11 ....5.475
Worcester,Mass. A7 ..4.975

STRUCTURALS

Carbon Steel Stand. Shapes
Ala.City,Ala. R2 .....4.25
Aliquippa,Pa. J5 .....4.25
Bessemer,Ala. T2 .....4.25
Bethlehem,Pa. B2 .....4.30
Birmingham C15 .....4.25
Clairton,Pa. U5 .....4.25
Fairfield,Ala. T2 .....4.25
Fontana,Calif. K1 ....4.90
Gary,Ind. U5 .....4.25
Geneva,Utah C11 .....4.25
Houston S5 .....4.30
Ind.Harbor,Ind. I-2 ....4.25
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ...4.30
LosAngeles B3 .....4.90
Minnequa,Colo. C10 ....4.70
Munhall,Pa. U5 .....4.25
Niles,Calif. P1 .....4.90
Phoenixville,Pa. P4 ....3.95
Portland,Oreg. O4 .....5.00
Seattle B3 .....5.00
So.Chicago U5, W14 ....4.25
So.SanFrancisco B3 ....4.90
Torrance,Calif. C11 ....4.95
Weirton,W.Va. W6 .....4.25

Wide Flange
Bethlehem,Pa. B2 .....4.30
Clairton,Pa. U5 .....4.25
Fontana,Calif. K1 .....5.25
Lackawanna,N.Y. B2 ...4.30
Munhall,Pa. U5 .....4.25
Phoenixville,Pa. P4 ....4.30
So.Chicago,Ill. U5 .....4.25

Alloy Stand. Shapes
Clairton,Pa. U5 .....5.20
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.20
Houston S5 .....5.25
Munhall,Pa. U5 .....5.20
So.Chicago,Ill. U5 .....5.20

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....6.40
Bessemer,Ala. T2 .....6.40
Bethlehem,Pa. B2 .....6.45
Clairton,Pa. U5 .....6.40
Fairfield,Ala. T2 .....6.40
Fontana,Calif. K1 .....7.05
Gary,Ind. U5 .....6.40
Geneva,Utah C11 .....6.40
Houston S5 .....6.45
Ind.Harbor,Ind. I-2, Y1..6.40
Johnstown,Pa. B2 .....6.45
KansasCity,Mo. S5 ....6.45
Lackawanna,N.Y. B2 ...6.45
LosAngeles B3 .....7.10
Munhall,Pa. U5 .....6.40
Seattle B3 .....7.15
So.Chicago,Ill. U5, W14..6.40
So.SanFrancisco B3 ....7.05
Struthers,O. Y1 .....6.40

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....6.45
Lackawanna,N.Y. B2 ...6.45
Munhall,Pa. U5 .....6.40
So.Chicago,Ill. U5 .....6.40

PILING

BEARING PILES
Munhall,Pa. U5 .....4.25
So.Chicago,Ill. U5 .....4.25

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ...5.075
Lackawanna,N.Y. B2 ...5.075
Munhall,Pa. U5 .....5.075
So.Chicago,Ill. U5 .....5.075

PLATES

PLATES, Carbon Steel
Ala.City,Ala. R2 .....4.225
Aliquippa,Pa. J5 .....4.225
Ashland,Ky.(15) A10 ..4.225
Bessemer,Ala. T2 .....4.225
Bridgeport,Conn. N19 ..4.475
Buffalo R3 .....4.225
Clairton,Pa. U5 .....4.225
Claymont,Del. C22 ....4.225
Cleveland J5, R2 .....4.225
Coatesville,Pa. L7 ....4.225
Conshohocken,Pa. A3 ..4.225
Ecorse,Mich. G5 .....4.325
Fairfield,Ala. T2 .....4.225
Fontana,Calif.(30) K1..4.875
Gary,Ind. U5 .....4.225
Geneva,Utah C11 .....4.225
GraniteCity,Ill. G4 ....4.425
Harrisburg,Pa. C5 ....3.975
Houston S5 .....4.275
Ind.Harbor,Ind. I-2, Y1..4.225
Johnstown,Pa. B2 .....4.225
Lackawanna,N.Y. B2 ..4.225
Lonestar,Tex. L6 .....4.55
Mansfield,O. E6 .....4.225
Minnequa,Colo. C10 ....5.075
Munhall,Pa. U5 .....4.225
Newport,Ky. N9 .....4.225
Pittsburgh J5 .....4.225
Riverdale,Ill. A1 .....4.225
Seattle B3 .....5.125
Sharon,Pa. S3 .....4.225
So.Chicago,Ill. R2 .....4.225
So.Chicago,Ill. U5,W14..4.225
SparrowsPoint,Md. B2..4.225
Steubenville,O. W10 ...4.225
Warren,O. R2 .....4.225
Weirton,W.Va. W6 .....4.225
Youngstown R2,U5,Y1..4.225

PLATES, Carbon Abras. Resist.
Fontana,Calif. K1 ....6.025
Geneva,Utah C11 .....5.375

PLATES, Wrought Iron
Economy,Pa. B14 .....9.80

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.45
Bessemer,Ala. T2 .....6.45
Clairton,Pa. U5 .....6.45
Cleveland J5, R2 .....6.45
Coatesville,Pa. L7 .....6.45
Conshohocken,Pa. A3 ...6.45
Ecorse,Mich. G5 .....6.55
Fairfield,Ala. T2 .....6.45
Fontana,Calif.(30) K1 ..7.10
Gary,Ind. U5 .....6.45
Geneva,Utah C11 .....6.45
Houston S5 .....6.50
Ind.Harbor,Ind. I-2, Y1..6.45
Johnstown,Pa. B2 .....6.45
Lackawanna,N.Y. B2 ...6.45
LosAngeles B3 .....7.35
Munhall,Pa. U5 .....6.45
Pittsburgh J5 .....6.45
Seattle B3 .....7.35
Sharon,Pa. S3 .....6.45
So.Chicago,Ill. U5, W14..6.45
SparrowsPoint,Md. B2...6.45
Youngstown U5, Y1 ....6.45

PLATES, Alloy
Claymont,Del. C22 ....5.80
Coatesville,Pa. L7 .....5.80
Fontana,Calif. K1 .....6.45
Gary,Ind. U5 .....5.80
Houston S5 .....5.85
Ind.Harbor,Ind. Y1 ....5.80
Johnstown,Pa. B2 .....5.80
Munhall,Pa. U5 .....5.80
Newport,Ky. N9 .....5.80
Seattle B3 .....6.70
Sharon,Pa. S3 .....5.80
So.Chicago,Ill. U5, W14..5.80
SparrowsPoint,Md. B2..5.80
Youngstown Y1 .....5.80

FLOOR PLATES
Cleveland J5 .....5.275
Conshohocken,Pa. A3 ..5.275
Harrisburg,Pa. C5 ....5.15
Ind.Harbor,Ind. I-2 ...5.275
Munhall,Pa. U5 .....5.275
So.Chicago,Ill. U5 .....5.275

PLATES, Ingot Iron
Ashland c.l. (15) A10..4.475
Ashland l.e.l. (15) A10..4.975
Cleveland c.l. R2 .....4.825
Warren,O. c.l. R2 ....4.825

BARS

BARS, Hot-Rolled Carbon
Ala.City,Ala. R2 .....4.30
Aliquippa,Pa. J5 .....4.30
Alton,Ill. L1 .....4.50
Atlanta,Ga. A11 .....4.50
Bessemer,Ala. T2 .....4.30
Birmingham C15 .....4.30
Bridgeport,Conn. N19 ..4.55
Buffalo R3 .....4.30
Canton,O. R2 .....4.40
Clairton,Pa. U5 .....4.30
Cleveland R2 .....4.30
Ecorse,Mich. G5 .....4.40
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 .....4.30
FairlessHills,Pa. U5 ....4.45
Fontana,Calif. K1 .....5.00
Gary,Ind. U5 .....4.30
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1..4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 .....4.55
Lackawanna,N.Y. B2 ...4.30
LosAngeles B3 .....5.00
Massillon,O. R2 .....4.40
Midland,Pa. C18 .....4.30
Milton,Pa. M18 .....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....5.00
N.Tonawanda,N.Y. B11..4.30
Pittsburg,Calif. C11 ....5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
Seattle B3, N14, P23 ...5.05
So.Chicago, R2,U5,W14..4.30
So.Duquesne,Pa. U5 ....4.30
So.SanFran.,Calif. B3 ...5.05
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 .....4.40
Struthers,O. Y1 .....4.30
Torrance,Calif. C11 ....5.00
Warren,O. R2 .....4.30
Weirton,W.Va. W6 .....4.30
Youngstown R2, U5 ....4.30

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....5.075
Bridgeport,Conn. N19 ..5.225
Buffalo R2 .....5.075
Canton,O. R2, T7 ....5.075
Clairton,Pa. U5 .....5.075
Detroit R7 .....5.075
Ecorse,Mich. G5 .....5.175
Fontana,Calif. K1 .....6.125
FairlessHills,Pa. U5 ..5.225
Gary,Ind. U5 .....5.075
Houston S5 .....5.325
Ind.Harbor,Ind. I-2, Y1..5.075
Johnstown,Pa. B2 .....5.075
KansasCity,Mo. S5 .....5.325
Lackawanna,N.Y. B2 ...5.075
LosAngeles B3 .....6.125
Massillon,O. R2 .....5.075
Midland,Pa. C18 .....5.075
So.Chicago R2, U5,W14 5.075
So.Duquesne,Pa. U5 ...5.075
Struthers,O. Y1 .....5.075
Warren,O. C17 .....5.075
Youngstown U5 .....5.075

BARS, H.R. Leaded Alloy
Warren,O. C17 .....5.825

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.45
Bessemer,Ala. T2 .....6.45
Bethlehem,Pa. B2 .....6.45
Clairton,Pa. U5 .....6.45
Cleveland R2 .....6.45
Ecorse,Mich. G5 .....6.55
Fairfield,Ala. T2 .....6.45
Fontana,Calif. K1 .....7.70
Gary,Ind. U5 .....6.45
Houston S5 .....6.70
Ind.Harb.,Ind. I-2, Y1..6.45
Johnstown,Pa. B2 .....6.45
KansasCity,Mo. S5 .....6.70
Lackawanna,N.Y. B2 ...6.45
LosAngeles B3 .....7.15
Pittsburgh J5 .....6.45
Seattle B3 .....7.20
So.Chicago W14 .....6.45
So.Duquesne,Pa. U5 ....6.45
So.SanFrancisco B3 ....7.20
Struthers,O. Y1 .....6.45
Warren,O. R2 .....6.45
Youngstown U5 .....6.45

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa. B2 .....4.45

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....4.30
Atlanta A11 .....4.50
Fontana,Calif. K1 .....5.00
Niles,Calif. P1 .....5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
SanFrancisco S7 .....4.70

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....5.20
Gary,Ind. U5 .....5.20
Houston S5 .....5.45
KansasCity S5 .....5.45
Youngstown U5 .....5.20

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....5.40
BeaverFalls,Pa. M12, R3 5.40
Buffalo B5 .....5.45
Camden,N.J. P13 .....5.85
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7, C20 .....5.40
Detroit R7 .....5.40
Detroit B5, P17 .....5.90
Donora,Pa. A7 .....5.40
Elyria,O. W8 .....5.40
FranklinPark,Ill. N5 ....5.40
Gary,Ind. R2 .....5.40
GreenBay,Wis. F7 .....5.40
Hammond,Ind. L2, M13 5.40
Hartford,Conn. R2 .....5.90
Harvey,Ill. B5 .....5.40
LosAngeles R2, S30 ....6.85
Mansfield,Mass. B5 ....5.95
Massillon,O. R2, R8 ....5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.85
NewCastle,Pa.(17) B4 ..5.40
Pittsburgh J5 .....5.40
Plymouth,Mich. P5 ....5.65
Putnam,Conn. W18 ....5.95
Readville,Mass. C14 ....5.95
So.Chicago,Ill. W14 ....5.40
SpringCity,Pa. K3 .....5.85
Struthers,O. Y1 .....5.40
Waukegan,Ill. A7 .....5.40
Worcester,Mass. W19 ...5.85
Youngstown F3, Y1 ....5.40

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19..4.65

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....6.625
BeaverFalls,Pa. M12,R2 6.625
Bethlehem,Pa. B2 ....6.625
Buffalo B5 .....6.625
Camden,N.J. P13 .....6.80
Canton,O. T7 .....6.625
Carnegie,Pa. C12 .....6.625
Chicago W18 .....6.625
Cleveland A7, C20 ....6.625
Detroit R7 .....6.625
Detroit B5, P17 .....6.825
Donora,Pa. A7 .....6.625
Elyria,O. W8 .....6.625
Gary,Ind. R2 .....6.625
GreenBay,Wis. F7 ....6.625
Hammond,Ind. L2, M13 6.625
Hartford,Conn. R2 ....6.925
Harvey,Ill. B5 .....6.625
Lackawanna,N.Y. B2 ..6.625
LosAngeles S30 .....8.30
Mansfield,Mass. B5 ..6.925
Massillon,O. R2, R8 ..6.625
Midland,Pa. C18 .....6.625
Monaca,Pa. S17 .....6.625
Newark,N.J. W18 .....6.80
Plymouth,Mich. P5 ....6.825
So.Chicago W14 .....6.625
SpringCity,Pa. K3 ....6.80
Struthers,O. Y1 .....6.625
Warren,O. C17 .....6.625
Waukegan,Ill. A7 .....6.625
Worcester,Mass. A7 ..6.925
Youngstown F3, Y1 ....6.625

BARS, C.F. Leaded Alloy
Ambridge,Pa. W18 ....7.525
Camden,N.J. P13 .....7.70
Carnegie,Pa. C12 .....7.525
Chicago W18 .....7.535
Cleveland C20 .....7.525
Monaca,Pa. S17 .....7.535
Newark,N.J. W18 .....7.70
SpringCity,Pa. K3 .....7.70
Warren,O. C17 .....7.525

BARS, Reinforcing (To Fabricators)
Ala.City,Ala. R2 .....4.30
Atlanta A11 .....4.50
Birmingham C15 .....4.30
Buffalo R2 .....4.30
Cleveland R2 .....4.30
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 .....4.30
FairlessHills,Pa. U5 ....4.45
Fontana,Calif. K1 .....5.00
Ft.Worth,Tex.(42) T4 ..4.90
Gary,Ind. U5 .....4.30
Houston S5 .....4.55

Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 .....4.05
Lackawanna,N.Y. B2 ...4.30
LosAngeles B3 .....5.00
Milton,Pa. M18 .....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....5.00
Pittsburg,Calif. C11 ....5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
SandSprings,Okla. S5 ...4.80
Seattle B3, N14, P23 ...5.05
So.Chicago R2 .....4.30
So.Duquesne,Pa. U5 ....4.30
So.SanFrancisco B3 ....5.05
SparrowsPoint,Md. B2..4.30
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 .....4.40
Struthers,O. Y1 .....4.30
Torrance,Calif. C11 ....5.00
Youngstown R2, U5 ....4.30

BARS, Reinforcing
(Fabricated; to Consumers)

Johnstown,Pa. ¼-1" B2 5.70
KansasCity S5 .....6.50
LosAngeles B3 .....5.95
Marion,O. P11 .....5.55
Pittsburgh J5, U5 .....5.72
Seattle B3, N14, P23 ...6.15
So.SanFrancisco B3 ....6.00
SparrowsPt. ¼-1" B2..5.70
Williamsport,Pa. B19 ...5.60

RAIL STEEL BARS

Avis,Pa.(3) J5 .....4.25
ChicagoHts.(5) C2, I-2..4.20
ChicagoHts.(4) C2, I-2..4.30
Ft.Worth,Tex.(26) T4 ..4.75
Franklin,Pa.(3) F5 ....4.20
Franklin,Pa.(4) F5 ....4.30
Marion,O.(3) P11 .....4.15
Moline,Ill.(3) R2 .....4.30
Tonawanda(3) B12 ....4.15
Tonawanda(4) B12 ....4.30
Williamsport,Pa.(3) B19.4.30

BARS, Wrought Iron

Economy,Pa.(S.R.) B14 10.85
Economy,Pa.(D.R.) B14 13.50
Economy(Staybolt) B14 13.80
McK.Rks.(S.R.) L5 ....10.85
McK.Rks.(D.R.) L5 ..14.75
McK.Rks.(Staybolt) L5 16.25

SHEETS

SHEETS, Hot-Rolled Steel
(18 Gage and Heavier)

Ala.City,Ala. R2 .....4.00
Allenport,Pa. P7 .....4.05
Ashland,Ky.(8) A10 ....4.00
Cleveland J5, R2 .....4.05
Conshohocken,Pa. A3 ..4.10
Detroit(8) M1 .....4.15
Ecorse,Mich. G5 .....4.15
Fairfield,Ala. T2 .....4.05
FairlessHills,Pa. U5 ....4.10
Fontana,Calif. K1 ....4.825
Gary,Ind. U5 .....4.05
Geneva,Utah C11 .....4.15
GraniteCity,Ill. G4 .....4.25
Ind.Harbor,Ind. I-2, Y1.4.05
Irvin,Pa. U5 .....4.05
Kokomo,Ind. C16 .....4.15
Lackawanna,N.Y. B2 ..4.05
Mansfield,O. E6 (37) ..4.05
Mansfield,O. E6(38) ...4.80
Munhall,Pa. U5 .....4.05
Newport,Ky. N9 .....4.05
Niles,O. N12 .....4.05
Pittsburg,Calif. C11 ....4.75
Pittsburgh J5 .....4.05
Portsmouth,O. P12 ....4.05
Riverdale,Ill. A1 .....4.05
Sharon,Pa. S3 .....4.05
So.Chicago,Ill. W14 ....4.05
SparrowsPoint,Md. B2 ..4.05
Steubenville,O. W10 ....4.05
Warren,O. R2 .....4.05
Weirton,W.Va. W6 ....4.05
Youngstown U5, Y1 ....4.05

SHEETS, H.R. (19 Ga. & Lighter)

Ala.City,Ala. R2 .....5.25
Kokomo,Ind. C16 .....5.20
Niles,O. N12 .....4.95

SHEETS, H.R. Alloy

Ind.Harbor,Ind. Y1 .....5.80
Youngstown Y1 .....5.80

SHEETS, H.R. (14 ga. heavier)
High-Strength Low-Alloy

Cleveland J5, R2 .....6.10
Conshohocken,Pa. A3 ...6.15
Ecorse,Mich. G5 .....6.20
Fairfield,Ala. T2 .....6.10
FairlessHills,Pa. U5 ....6.15
Fontana,Calif. K1 ....6.875
Gary,Ind. U5 .....6.10
Ind.Harbor,Ind. I-2, Y1.6.10
Irvin,Pa. U5 .....6.10
Lackawanna(35) B2 ....6.10
Munhall,Pa. U5 .....6.10
Pittsburgh J5 .....6.10
Sharon,Pa. S3 .....6.10
So.Chicago,Ill. U5 .....6.10
SparrowsPoint(36) B2...6.10
Warren,O. R2 .....6.10
Weirton,W.Va. W6 ....6.10
Youngstown U5, Y1 ....6.10

SHEETS, Hot-Rolled Ingot Iron
(18 Gage and Heavier)

Ashland,Ky.(8) A10 ....4.30
Cleveland R2 .....4.65
Ind.Harbor,Ind. I-2 ....4.30
Warren,O. R2 .....4.65

SHEETS, Cold-Rolled Steel
(Commercial Quality)

Allenport,Pa. P7 .....4.95
Cleveland J5, R2 .....4.95
Conshohocken,Pa. A3 ...5.00
Ecorse,Mich. G5 .....5.00
Fairfield,Ala. T2 .....4.95
FairlessHills,Pa. U5 ....5.00
Follansbee,W.Va. F4 ...4.95
Fontana,Calif. K1 .....6.05
Gary,Ind. U5 .....4.95
GraniteCity,Ill. G4 .....5.15
Ind.Harbor,Ind. I-2, Y1.4.95
Irvin,Pa. U5 .....4.95
Lackawanna,N.Y. B2 ..4.95
Middletown,O. A10 .....4.95
Newport,Ky. N9 .....4.95
Pittsburg,Calif. C11 ....5.90
Pittsburgh J5 .....4.95
Portsmouth,O. P12 ....4.95
SparrowsPoint,Md. B2..4.95
Warren,O. R2 .....4.95
Weirton,W.Va. W6 ....4.95
Youngstown Y1 .....4.95

SHEETS, Cold-Rolled
High-Strength Low-Alloy

Cleveland J5, R2 .....7.50
Ecorse,Mich. G5 .....7.90
FairlessHills,Pa. U5 ....7.55
Fontana,Calif. K1 .....8.58
Gary,Ind. U5 .....7.50
IndianaHarbor,Ind. Y1..7.50
Irvin,Pa. U5 .....7.50
Lackawanna(37) B2 ....7.50
Pittsburgh J5 .....7.50
SparrowsPoint(38) B2 ..7.50
Warren,O. R2 .....7.50
Weirton,W.Va. W6 ....7.50
Youngstown Y1 .....7.50

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....5.55
Middletown,O. A10 .....5.45
Warren,O. R2 .....5.55

SHEETS, Culvert (16 Ga.)

	Cu	Cu
	Alloy	Fe
Ashland,Ky. A10	6.50	....
Canton,O. R2	6.50	7.10
Fairfield T2	5.70	....
Gary,Ind. U5	5.70	5.95
Ind.Harbor I-2	5.70	5.95
Irvin,Pa. U5	5.70	....
Kokomo,Ind. C16	5.80	....
MartinsFry.,O. W10	5.70	....
Newport,Ky. N9	5.70	5.95
Pitts.,Calif. C11	6.45	....
SparrowsPt. B2	5.70	....

SHEETS, Culvert—Pure Iron

Ashland,Ky. A10 .....6.75
Gary,Ind. U5 .....5.95
MartinsFerry,O. W10 ..5.95

SHEETS, Galvanized Steel
Hot-Dipped

Ala.City,Ala. R2 .....5.45‡
Ashland,Ky. A10 .....5.45*
Butler,Pa. A10 .....5.45†
Canton,O. R2 .....5.45‡
Delphos,O. N16 .....6.10‡
Dover,O. R1 .....5.45‡
Fairfield,Ala. T2 .....5.45†
Gary,Ind. U5 .....5.40*
GraniteCity,Ill. G4 ....5.60‡
Ind.Harbor,Ind. I-2 ...5.45†
Irvin,Pa. U5 .....5.45†
Kokomo,Ind. C16 .....5.55‡
MartinsFerry,O. W10 ..5.45*
Middletown,O. A10 ...5.45†
Newport,Ky. N9 .....5.45†
Niles,O. N12 .....5.45‡
Pittsburg,Calif. C11 ...6.20*
SparrowsPt.,Md. B2 ..5.45‡
Weirton,W.Va. W6 ....5.45*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....6.325

SHEETS, Galvanized
High-Strength Low-Alloy

Irvin,Pa. U5 .....8.20
SparrowsPoint(39) B2 ..8.20

SHEETS, Galvannealed Steel

Canton,O. R2 .....5.85
Irvin,Pa. U5 .....5.85
Kokomo,Ind. C16 .....6.20
Newport,Ky. N9 .....5.85
Niles,O. N12 .....5.85

SHEETS, Galvanized Ingot Iron

Ashland,Ky.(8) A10 ...5.70
Canton,O. R2 .....6.20

SHEETS, Galvanized
Ingot Iron
(Hot-Dipped Continuous)

Ashland,Ky. A10 .....5.70
Butler,Pa. A10 .....5.70
Middletown,O. A10 ....5.70

SHEETS, Electrogalvanized

Cleveland(28) R2 .....6.30
Niles,O.(28) R2 .....6.30
Weirton,W.Va. W6 ....6.15

SHEETS, Aluminum Coated

Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ...5.375
Cleveland R2 .....5.375
Gary,Ind. U5 .....5.375
GraniteCity,Ill. G4 ....5.575
Ind.Harbor,Ind. I-2 ...5.375
Irvin,Pa. U5 .....5.375
Middletown,O. A10 ....5.375
Niles,O. N12 .....5.375
Youngstown Y1 .....5.375

BLUED STOCK, 29 Ga.

Follansbee,W.Va. F4 ..7.375
Follansbee(23) F4 .....6.60
Yorkville,O. W10 .....7.375

SHEETS, Long Terne Steel
(Commercial Quality)

BeechBottom,W.Va. W10 5.85
Gary,Ind. U5 .....5.85
Mansfield,O. E6 .....5.85
Middletown,O. A10 ....5.85
Niles,O. N12 .....5.85
Weirton,W.Va. W6 ....5.85

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....8.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div. Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro MetalIurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman & Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.High Carb. Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W.Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.05
Allenport,Pa. P7	4.05
Alton,Ill. L1	4.225
Ashland,Ky.(8) A10	4.05
Atlanta A11	4.25
Bessemer,Ala. T2	4.05
Birmingham C18	4.05
Bridgeport,Conn. N19	4.35
Buffalo(27) R2	4.05
Conshohocken,Pa. A3	4.10
Detroit M1	4.15
Ecorse,Mich. G5	4.15
Fairfield,Ala. T2	4.05
Fontana,Calif. K1	4.825
Gary,Ind. U5	4.05
Ind.Harbor,Ind. I-2, Y1	4.05
Johnstown,Pa.(25) B2	4.05
Lackaw'na,N.Y.(25) B2	4.05
LosAngeles(25) B3	4.80
Milton,Pa. M18	4.05
Minnequa,Colo. C10	5.15
N.Tonawanda,N.Y. B11	4.05
Pittsburg,Calif. C11	4.80
Portsmouth,O. P12	4.05
Riverdale,Ill. A1	4.05
SanFrancisco S7	5.00
Seattle(25) B3, P23	5.05
Seattle N14	5.05
Sharon,Pa. S3	4.05
So.Chicago,Ill. W14	4.05
So.SanFrancisco(25) B3	4.80
SparrowsPoint,Md. B2	4.05
Sterling(1) N15	4.05
Sterling,Ill. N15	4.15
Torrance,Calif. C11	4.80
Warren,O. R2	4.05
Weirton,W.Va. W6	4.05
Youngstown U5	4.05

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19	7.00
Carnegie,Pa. S18	6.70
Fontana,Calif. K1	8.10
Gary,Ind. U5	6.70
Ind.Harbor,Ind. Y1	6.70
LosAngeles B3	7.90
Newport,Ky. N9	6.70
Seattle P23	7.80
Sharon,Pa. S3	6.70
So.Chicago W14	6.70
Youngstown U5, Y1	6.70

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	6.15
Conshohocken,Pa. A3	6.15
Ecorse,Mich. G5	6.25
Fairfield,Ala. T2	6.15
Fontana,Calif. K1	7.26
Gary,Ind. U5	6.15
Houston S5	6.40
Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.40
Lackawanna,N.Y. B2	6.15
LosAngeles(25) B3	6.90
Seattle(25) B3, P23	7.15
Sharon,Pa. S3	6.15
So.SanFrancisco(25) B3	6.90
SparrowsPoint,Md. B2	6.15
Warren,O. R2	6.15
Weirton,W.Va. W6	6.15
Youngstown U5, Y1	6.15

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.30
Warren,O. R2	4.05

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	5.75
Baltimore T6	5.75
Boston T6	6.30
Cleveland A7, J5	5.75
Conshohocken,Pa. A3	5.80
Dearborn,Mich. D3	5.85
Detroit D2, M1, P20	5.85
Dover,O. G6	5.75
Ecorse,Mich. G5	5.85
Follansbee,W.Va. F4	5.75
Fontana,Calif. K1	7.65
FranklinPark,Ill. T6	5.85
Ind.Harbor,Ind. I-2	5.85
Ind.Harbor,Ind. Y1	5.75
Indianapolis C6	5.90
Lackawanna,N.Y. B2	5.75
LosAngeles C1	7.80
Middletown,O. A10	5.75
NewBedford,Mass. R10, 6.20	
NewBritain(10) S15	5.75
NewCastle,Pa. B4, E5	5.75
NewHaven,Conn. A7	6.50
NewHaven,Conn. D2	6.20
NewKensington,Pa. A6	5.75
Pawtucket,R.I. R3	6.40
Pawtucket,R.I. N8	6.30
Pittsburgh J5	5.75
Portsmouth,O. P12	5.75
Riverdale,Ill. A1	5.85
Rome,N.Y.(32) R6	5.75
Sharon,Pa. S3	5.75
SparrowsPt.,Md. B2	5.75
Trenton,N.J.(31) R5	7.30
Wallingford,Conn. W2	6.30
Warren,O. B9, R2, T5	5.75
Weirton,W.Va. W6	5.75
Worcester,Mass. A7	6.60
Youngstown C8, Y1	5.75

STRIP, Cold-Rolled Alloy

Boston T6	12.80
Carnegie,Pa. S18	12.45
Cleveland A7	12.45
Dover,O. G6	12.45
Fontana,Calif. K1	14.55
FranklinPark,Ill. T6	12.45
Harrison,N.J. C18	12.45
Pawtucket,R.I. N8	12.80
Sharon,Pa. S3	12.45
Worcester,Mass. A7	12.75
Youngstown C8	12.90

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7, J5	5.60
Dearborn,Mich. D3	5.70
Dover,O. G6	5.60
Ecorse,Mich. G5	5.70
Ind.Harbor,Ind. Y1	5.60
Lackawanna,N.Y. B2	5.425
Pittsburgh J5	5.60
Sharon,Pa. S3	5.60
SparrowsPoint,Md. B2	5.425
Warren,O. R2	5.60
Weirton,W.Va. W6	5.60
Youngstown Y1	5.60

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	6.25

STRIP, Electrogalvanized

Cleveland A7	5.75*
Dover,O. G6	5.75*
Riverdale,Ill. A1	5.55*
Youngstown C8	5.75*
Warren,O. B9, T5	5.75*
Weirton,W.Va. W6	5.75*
Worcester,Mass. A7	6.60*

*Plus galvanizing extras.

Strip, Galvanized (Continuous)

Sharon,Pa. S3	6.15
Warren,O. B9	6.15

TIGHT COOPERAGE HOOP

Atlanta A11	4.775
Riverdale,Ill. A1	4.625
Sharon,Pa. S3	4.475
Youngstown U5	4.475

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.75	8.35	9.30	11.45	14.15
Boston T6	6.30	8.35	9.30	11.45	14.15
Bristol,Conn. W1	...	...	9.30	11.45	....
Carnegie,Pa. S18	....	8.05	9.00	11.15	13.85
Cleveland A7	5.75	8.05	9.00	11.15	13.85
Cleveland C7	....	8.05	9.00	11.15	13.85
Dearborn,Mich. D3	5.85	8.25	9.20	....	....
Detroit D2	5.85	8.25	9.20	10.95	....
Dover,O. G6	5.85	8.05	9.00	11.15	13.85
FranklinPark,Ill. T6	5.85	8.05	9.00	11.15	13.85
Harrison,N.J. C18	....	...	9.30	11.45	14.15
Indianapolis C6	6.00	8.20	9.00	11.15	13.85
NewBritain,Conn.(10) S15	5.75	8.05	9.00	11.15	13.85
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	....
NewCastle,Pa. E5	5.75	8.05	9.00	11.15	13.85
NewHaven,Conn. D2	6.20	8.35	9.30	11.25	....
NewKensington,Pa. A6	5.75	8.05	9.00	11.15	....
NewYork W3	....	8.35	9.30	11.45	14.15
Pawtucket,R.I. N8	6.30	8.35	9.30	11.45	14.15
Riverdale,Ill. A1	5.85	8.05	9.00	11.15	13.85
Rome,N.Y.(32) R6	5.75	8.05	9.00	10.95	13.25
Sharon,Pa. S3	5.75	8.05	9.00	11.15	13.85
Trenton,N.J. R5	....	8.35	9.30	11.45	14.15
Wallingford,Conn. W2	6.20	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.05	9.00	11.15	13.85
Weirton,W.Va. W6	5.75	8.05	9.00	11.15	13.85
Worcester,Mass. A7, T6	6.60	8.35	9.30	11.45	14.15
Youngstown C8	5.85	8.05	9.00	11.15	13.85
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	12.90	15.60	....
Buffalo W12	..	...	12.90	....	....
FranklinPark,Ill. T6	....	...	13.40	16.10	19.50
Harrison,N.J. C18	....	...	12.90	15.60	19.00
NewYork W3	....	...	12.90	15.60	19.00
Trenton,N.J. R5	....	...	12.90	15.60	19.00
Worcester,Mass. A7, T6	....	...	12.90	15.60	19.00
Worcester,Mass. W12	....	...	12.90	....	....
Youngstown C8	....	...	13.25	15.95	19.35

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	9.10	10.10	11.00
Brackenridge,Pa. A4	....	....	9.10	10.10	11.00
Mansfield,O. E6	8.025	8.50	9.10	10.10	11.00
Newport,Ky. N9	8.025	8.50	9.10	10.10	11.00
Niles,O. N12	8.025	8.50	9.10	10.10	....
Vandergrift,Pa. U5	....	8.50	9.10	10.10	11.00
Warren,O. R2	8.025	8.50	9.10	10.10	11.00
Zanesville,O. A10	....	8.50	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	....	....	9.85	10.85	11.75
GraniteCity,Ill. G4	8.425*‡	8.95*	9.35*‡	10.50*	....
IndianaHarbor,Ind. I-2	8.225	8.75*	9.35*	....	....
Vandergrift,Pa. U5	....	9.25†	9.85†	10.85†	11.75†
Vandergrift,Pa. U5	8.225*	8.75*	9.35*	10.35*	11.25*
Warren,O. R2	8.225†	9.25	9.85	10.85	11.75
Zanesville,O. A10	....	9.25	9.85	10.85	11.75

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.95	12.50	13.00	14.00
Brackenridge,Pa. A4	11.95	....	....	....
Newport,Ky. N9	11.95	....	....	....
Vandergrift,Pa. U5	11.95	12.50	13.00	14.00
Zanesville,O. A10	11.95‡	12.50‡	13.00‡	14.00‡

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.00	16.60	17.10	....
Butler,Pa. A10	....	....	16.60	17.10	....
Vandergrift,Pa. U5	14.60	15.00	16.60	17.10	12.70‡
Warren,O. R2	....	....	....	....	12.70‡

* Semiprocessed. † Fully processed only. ‡ Coils annealed; semiprocessed ½c lower. ‖ Coils, ¾-cent higher.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Fairfield,Ala. T2	7.60	7.85	8.25
FairlessHills,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Irvin,Pa. U5	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton,W.Va. W6	7.50	7.75	8.15
Yorkville,O. W10	7.50	7.75	8.15

ELECTROTIN (22-27 Gage; Dollars per 100 lb)

Aliquippa,Pa. J5	6.175	....	....
Niles,O. R2	6.175	6.375	6.575

TINPLATE,American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.80	$9.05
Fairfield,Ala. T2	8.90	9.15
Fairless,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.05
Ind.Har. I-2, Y1	8.80	9.05
Irvin,Pa. U5	8.80	9.05
Pitts.Cal. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Warren,O. R2	8.00	9.05
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.60
Fairfield,Ala. T2	6.70
FairlessHills,Pa. U5	6.70
Gary,Ind. U5	6.60
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.60
Irwin,Pa. U5	6.60
Niles,O. R2	6.60
Pittsburg,Calif. C11	7.35
SparrowsPoint,Md. B2	6.70
Warren,O. R2	6.60
Weirton,W.Va. W6	6.60
Yorkville,O. W10	6.60

HOLLOWARE ENAMELING Black Plate (29 Gage)

Follansbee,W.Va. F4	6.20
Gary,Ind. U5	6.20
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.20
Irvin,Pa. U5	6.20
Yorkville,O. W10	6.20

MANUFACTURING TERNES (Special Coated; Base Box)

Gary,Ind. U5	$7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	$8.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.75
Aliquippa,Pa. J5	5.75
Alton,Ill. L1	5.925
Atlanta A11	5.95
Bartonville,Ill. K4	5.85
Buffalo W12	5.75
Chicago W12	5.75
Cleveland A7, C20	5.75
Crawfordsville,Ind. M8	5.85
Donora,Pa. A7	5.75
Duluth,Minn. A7	5.75
Fairfield,Ala. T2	5.75
Fostoria,O.(24) S1	5.95
Houston S5	6.00
Jacksonville,Fla. M8	6.27
Johnstown,Pa. B2	5.75
Joliet,Ill. A7	5.75
KansasCity,Mo. S5	6.00
Kokomo,Ind. C16	5.85
LosAngeles B3	6.70
Minnequa,Colo. C10	6.00
Monessen,Pa. P7	5.75
Newark 6-8 ga. I-1	6.40
No.Tonawanda B11	5.75
Palmer,Mass. W12	6.05
Pittsburg,Calif. C11	6.70
Portsmouth,O. P12	5.75
Rankin,Pa. A7	5.75
So.Chicago,Ill. R2	5.75
So.SanFrancisco C10	6.70
SparrowsPoint,Md. B2	5.85
Sterling,Ill.(1) N15	5.75
Sterling,Ill. N15	5.85
Struthers,O. Y1	5.75
Waukegan,Ill. A7	5.75
Worcester,Mass. A7	6.00

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	7.20
Alton,Ill. L1	7.375
Bartonville,Ill. K4	7.30
Buffalo W12	7.20
Cleveland A7	7.30
Donora,Pa. A7	7.20
Duluth,Minn. A7	7.20
Fostoria,O. S1	7.20
Johnstown,Pa. B2	7.30
LosAngeles B3	8.15
Milbury,Mass.(12) N6	7.50
Minnequa,Colo. C10	7.45
Monessen,Pa. P7, P16	7.20
Muncie,Ind. I-7	7.40
Palmer,Mass. W12	7.50
Pittsburg,Calif. C11	8.15
Portsmouth,O. P12	7.20
Roebling,N.J. R5	7.50
So.Chicago,Ill. R2	7.20
So.SanFrancisco C10	8.15
SparrowsPt.,Md. B2	7.20
Struthers,O. Y1	7.20
Trenton,N.J. A7	7.50
Waukegan,Ill. A7	7.20
Worcester A7,J4,T6,W12	7.50

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.90
Alton,Ill. L1	7.075
Buffalo W12	6.90
Cleveland A7	6.90
Donora,Pa. A7	6.90
Duluth,Minn. A7	6.90
Johnstown,Pa. B2	6.90
KansasCity,Mo. S5	7.50
LosAngeles B3	7.85
Minnequa,Colo. C10	7.075
Monessen,Pa. P7, P16	6.90
NewHaven,Conn. A7	7.20
Palmer,Mass. W12	7.20
Pittsburg,Calif. C11	7.85
Portsmouth,O. P12	6.90
Roebling,N.J. R5	7.20
So.Chicago,Ill. R2	6.90
So.SanFrancisco C10	7.85
SparrowsPoint,Md. B2	7.00
Struthers,O. Y1	6.90
Trenton,N.J. A7	7.20
Waukegan,Ill. A7	6.90
Worcester,Mass. A7	7.20

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	11.375
Bartonville,Ill. K4	11.30
Buffalo W12	11.20
Chicago W13	11.20
Cleveland A7	11.20
Crawfordsville,Ind. M8	11.30
Fostoria,O. S1	11.20
Jacksonville,Fla. M8	11.73
Johnstown,Pa. B2	11.20
Kokomo,Ind. C16	11.20
Minnequa,Colo. C10	10.95
Monessen,Pa. P16	11.20
Muncie,Ind. I-7	11.40
Palmer,Mass. W12	11.50
Roebling,N.J. R5	11.50
So.SanFrancisco C10	11.55
Waukegan,Ill. A7	11.20
Worcester,Mass. A7,T6	11.50

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	9.90
Buffalo W12	9.90
Johnstown,Pa. B2	9.90
Minnequa,Colo. C10	10.025
Monessen,Pa. P16	9.90
Muncie,Ind. I-7	10.10
Portsmouth,O. P12	9.90
Roebling,N.J. R5	10.20
SparrowsPt.,Md. B2	10.00

ROPE WIRE	(A)
Alton,Ill. L1	9.75
Bartonville,Ill. K4	9.75
Buffalo W12	9.75
Fostoria,O. S1	9.75
Johnstown,Pa. B2	9.75
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
SparrowsPt. B2	9.85
Struthers,O. Y1	9.75
Worcester J4, T6	9.65

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE

(Continued)

WIRE, Tire Bead

Alton,Ill. L1	13.25
Bartonville,Ill. K4	13.25
Monessen,Pa. P16	13.15
Portsmouth,O. P12	13.15
Roebling, N.J. R5	13.45

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	7.95
Baltimore T6	8.25
Buffalo W12	7.95
Cleveland A7	7.95
Crawfordsville,Ind. M8	8.05
Dover,O. G6	7.95
Fostoria,O. S1	7.95
FranklinPark,Ill. T6	8.05
Kokomo,Ind. C16	8.05
Massillon,O. R8	7.95
Milwaukee C23	8.15
Monessen,Pa. P7, P16	7.95
Pawtucket,R.I. N8	8.25
Rome,N.Y.(32) R6	7.95
Trenton,N.J. R5	8.25
Worcester A7, T6, W12	8.25

WIRE, Merchant Quality

(6 to 8 Gage)	An'ld Galv.
Ala.City,Ala. R2	6.90 7.30**
Aliquippa J5	6.90 7.425§
Atlanta A11	7.00 7.55
Bartonville(48) K4	7.00 7.55
Buffalo W12	6.90 7.30†
Cleveland A7	6.90
Crawfordsville M8	7.00 7.55
Donora,Pa. A7	6.90 7.30†
Duluth,Minn. A7	6.90 7.30†
Fairfield T2	6.90 7.30†
Houston,Tex. S5	7.15 7.55†
Jacks'ville,Fla. M8	7.425 7.95
JohnstownB2(48)	6.90 7.45*
Joliet,Ill. A7	6.90 7.30†
KansasCity,Mo. S5	7.15 7.55†
Kokomo C16	7.00 7.40†
LosAngeles B3	7.85
Minnequa C10	7.15 7.55**
Monessen P7 (48)	6.90 7.45
Palmer W12	7.20 7.60†
Pitts.,Calif. C11	7.85 8.25†
Portsmouth,O. P12	6.90
Rankin A7	6.90 7.30†
So.Chicago R2	6.90 7.30**
S.S.Fran. C10	7.85 8.25**
SparrwsPt.B2(48)	7.00 7.55*
Sterling(1)(48)	N15 6.90 7.45
Struthers,O.(48)	Y1 6.90 7.40†
Worcester A7	7.20

*Based on 11c zinc; †8c zinc; ‡Less than 10c zinc; **Subject to zinc equalization extras.

WOVEN Fence, 9-15½ Ga. Col.

Ala.City,Ala. R2	146**
Ala.City, 17 ga. R2	241**
Ala.City, 18 ga. R2	251**
Aliq'ppa,Pa.9-14½ga.J5	149§
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	146†
Duluth,Minn. A7	146†
Fairfield,Ala. T2	146†
Houston,Tex. S5	151†
Johnstown,Pa.(43) B2	149
Joliet,Ill. A7	146†
KansasCity,Mo. S5	151†
Kokomo,Ind. C16	148†
Minnequa,Colo. C10	151**
Monessen,Pa. 9 ga. P17	149
Pittsburg,Calif. C11	169†
Rankin,Pa. A7	146†
So.Chicago,Ill. R2	146**
Sterling,Ill.(1) N15	149

†Based on 8c zinc; *11c zinc; §10c zinc; **Subject to zinc equalization extras.

BALE TIES, Single Loop Col.

AlabamaCity,Ala. R2	155
Atlanta A11	157
Bartonville,Ill. K4	157
Crawfordsville,Ind. M8	157
Donora,Pa. A7	155
Duluth,Minn. A7	155
Fairfield,Ala. T2	155
Joliet,Ill. A7	155
Houston S5	160
KansasCity,Mo. S5	160
Kokomo,Ind. C16	157
Minnequa,Colo. C10	160
Pittsburg,Calif. C11	179
So.Chicago,Ill. R2	155
So.SanFran.,Calif. C10	179
SparrowsPoint,Md. B2	157
Sterling,Ill.(1) N15	155

WIRE, Barbed Col.

AlabamaCity,Ala. R2	159**
Aliquippa J5	156§
Atlanta A11	164
Bartonville,Ill. K4	164
Crawfordsville,Ind. M8	164
Donora,Pa. A7	159†
Duluth,Minn. A7	159†
Fairfield,Ala. T2	159†
Houston,Tex. S5	164†
Johnstown,Pa. B2	162*
Joliet,Ill. A7	159†
KansasCity,Mo. S5	164†
Kokomo,Ind. C16	161†
Minnequa,Colo. C10	164**
Monessen,Pa. P7	162
Pittsburg,Calif. C11	179†
Rankin,Pa. A7	159†
So.Chicago,Ill. R2	159**
S.SanFrancisco C10	179**
SparrowsPoint,Md. B2	164*
Sterling,Ill.(1) N15	162

†Based on 8c zinc; *11c zinc; §10c zinc; **Subject to zinc equalization extras.

WIRE (16 Gage)

	An'ld Galv.	Stone
Ala.City R2	13.15	14.70**
Bartonville K4	13.25	15.10
Buffalo W12	13.15	
Cleveland A7	13.15	
Crawfrdsville M8	13.25	15.10
Fostoria,O. S1	13.25	14.80†
Johnstown B2	13.15	15.00*
Kokomo C16	13.25	14.80†
Minnequa C10	13.40	15.10**
Palmer,Mass.W12	13.15	14.70†
Pitts.,Calif. C11	13.50	15.05†
So.Chicago R2	13.15	14.70
SparrowsPt. B2	13.25	15.10*
Sterling(1) N15	13.15	15.00
Waukegan A7	13.15	14.70†
Worcester A7	13.45	

*Based on 11c zinc; †8c zinc; §10c zinc; **Subject to zinc equalization extras.

NAILS, Stock

To Dealers & Mfrs. (7)	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	137
Atlanta A11	139
Bartonville,Ill. K4	139
Chicago,Ill. W13	137
Cleveland A9	142
Crawfordsville,Ind. M8	139
Donora,Pa. A7	137
Duluth,Minn. A7	137
Fairfield,Ala. T2	137
Galveston,Tex. D7	*145*
Houston, Tex. S5	142
Johnstown,Pa. B2	137
Joliet,Ill. A7	137
KansasCity,Mo. S5	142
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	156
Rankin,Pa. A7	137
So.Chicago,Ill. R2	137
SparrowsPt.,Md. B2	139
Sterling,Ill.(1) N15	137
Worcester,Mass. A7	143

NAILS, CUT (100 lb keg)

To Dealers (33)	
Conshohocken,Pa. A2	$6.30
Wheeling,W.Va. W10	6.30

STAPLES, Polished Stock

To Dealers & Mfrs. (7)	Col.
Aliquippa,Pa. J5	138
Atlanta A11	140
Bartonville,Ill. K4	139
Crawfordsville,Ind. M8	139
Donora,Pa. A7	138
Duluth,Minn. A7	138
Fairfield,Ala. T2	138
Johnstown,Pa. B2	136
Joliet,Ill. A7	138
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	157
Rankin,Pa. A7	138
SparrowsPt., Md. B2	140
Sterling,Ill.(1) N15	137
Worcester,Mass. A7	144

TIE WIRE, Automatic Baler (14½ Ga.) (Per 97 lb Net Box)

Coil No. 3150	
Donora,Pa. A7	$8.77
Duluth,Minn. A7	8.77
Joliet,Ill. A7	8.77

Coil No. 6500 Stand.	
Donora,Pa. A7	$9.05
Duluth,Minn. A7	9.05
Joliet,Ill. A7	9.05

Coil No. 6500 Interim	
Donora,Pa. A7	$9.10
Duluth,Minn. A7	9.10
Joliet,Ill. A7	9.10

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(Base discounts, per cent off list, f.o.b. midwestern plants)

6 in. and shorter:	
½-in. & smaller diam	2
Over 4 in. through 6 in.:	
½ in. & smaller diam	+3
6 in. and shorter:	
⅞-in. and ⅝-in.	+4
¾ in. and larger	+6
Longer than 6 in.:	
All diameters	+15
Lag bolts, all diams.:	
6 in. and shorter	6
Over 6 in. long	+2
Ribbed Necked Carriage	+4
Blank	10
Plow	23
Step, Elevator, Tap and Sleigh Shoes	10
Tire Bolts	+3
Boiler & Fitting-Up Bolts	21

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	55
H.P., Hex, regular & heavy:	
⅝" and smaller	55
¾" to 1¼", inclusive	50
1⅜" to 1½", inclusive	60
1⅝" and larger	55
C.P. Hex regular & heavy:	
All sizes	55
Hot Galv. Nuts (all types):	
⅝" or smaller	35
¾" to 1½", inclusive	41
Finished Hex Nuts:	
New standard, all sizes	55
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	55

SQUARE HEAD SET SCREWS

(1035 steel; packaged; per cent off list)

1 in. diam. x 6 in. and shorter	34
1 in. and smaller diam. x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam. & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	43
Plated finishes	23

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
¼ in. through ⅝-in.	38
⅝-in. through 1 in.	15
Longer than 6 in.:	
¼-in. through ⅝-in.	20
⅝-in. through 1 in.	7

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 9.25
⅞-in. under..List less 37%

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.59	19.00
1¼	13	....	23.21	18.77
1½	13	21.40	25.65	20.75
1⅝	13	25.28	30.31	24.52
2	13	23.33	33.97	27.48
2¼	12	31.91	38.28	30.95
2½	12	34.68	41.52	33.59
2⅝	12	38.15	45.74	37.00
2⅝	12	41.31	49.53	40.07
3	12	44.05	52.82	42.72

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	All No. 2	Too Rails 60 lb Under
RAILS				
Bessemer, Pa. U5	4.45	4.35	4.40	5.35
Ensley,Ala. T2	4.45	4.35	...	5.35
Fairfield,Ala. T2	...	...	...	5.35
Gary,Ind. U5	4.45	4.35	4.40	...
IndianaHarbor,Ind. I-2	4.45	4.35	4.40	...
Johnstown,Pa. B2	...	...	...	(16)5.35
Lackawanna,N.Y. B2	4.45	4.35	...	5.35
Minnequa,Colo. C10	4.45	4.35	...	5.85
Steelton,Pa. B2	4.45	4.35	...	5.35
Williamsport,Pa. S10	...	...	...	5.35

TIE PLATES

Fairfield,Ala. T2	5.275
Gary,Ind. U5	5.275
Ind.Harbor,Ind. I-2	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Seattle B3	5.425
Steelton,Pa. B2	5.275
Torrance,Calif. C11	5.425

TRACK BOLTS (20) Treated

Cleveland R2	11.50
KansasCity,Mo. S5	11.50
Lebanon,Pa. B2	11.50
Minnequa,Colo. C10	11.50
Pittsburgh O3, P14	11.50
Seattle B3	12.00

AXLES

Ind.Harbor,Ind. S13	6.75
Johnstown,Pa. B2	6.75

JOINT BARS

Bessemer,Pa. U5	5.425
Fairfield,Ala. T2	5.425
Ind.Harbor,Ind. I-2	5.425
Joliet,Ill. U5	5.425
Lackawanna,N.Y. B2	5.425
Minnequa,Colo. C10	5.425
Steelton,Pa. B2	5.425

SCREW SPIKES

Cleveland R2	11.00

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.30
Ind.Harbor,Ind. I-2, Y1	7.30
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.30
Minnequa,Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B3	7.80
So.Chicago,Ill. R2	7.30
Struthers,O. Y1	7.30
Youngstown R2	7.30

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron: 98+% Fe, annealed	15.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.25
Minus 20 mesh	9.00
Swedish, c.l.f. N.Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N. J., in bags	9.50
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in.	22.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns—83.00-148.00	
Aluminum: Atomized, 500 lb drums, frght. allowed:	
Carlots	30.00
Ton lots	32.00
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	29.75-37.25†
Bronze, 5000-lb lots	48.75-52.00†
Copper:	
Electrolytic	13.75*
Reduced	13.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	94.00
Nickel-Silver, 5000-lb lots	45.50‡
Nickel-Silver, 5000-lb lots	49.00**
Phosphor-Bronze, ½-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	91.00
Tin	14.50*
Zinc, 5000-lb lots	17.25-31.00‡
Tungsten Melting grade, 99% 80 to 200 mesh:	Dollars
1000 lb and over	5.95
Less than 1000 lb	6.10
Chromium, electrolytic 99.2% Cr min.	8.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Hexagon.
(5) 1⅛" to 1 7/16"; 1 7/16" to 1 15/16" 4.75c; 1 15/16" to 7 5/16" 5.15c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cents lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 0.30c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for unrevised.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 25" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon, add 0.40c for alloy and 0.35c H.S.-L.A.
(31) Widths over ⅝-in.; 6.45c for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 25c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & heavier; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9 lbs for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. to mill some or within switching limits, 5.10c.
(43) 9-14½ gage.
(48) 6-7 gage.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Ambridge, Pa. N2	13.5	..	17.5	...	20	...	21.5	...	21.5	...	20.75	...	23.25	...
Lorain, O. N3	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Youngstown Y1	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R3	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		8c		8c		8.5c		11.5c		17c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14
Alton, Ill. L1	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12
Benwood, W. Va. W10	24	+4.5	15.25	+10.25	7.25	+17.25	23.75	6.5	26.75	10.5	29.25	14
Butler, Pa. P6	25	+3.5	17	+8.5	9.5	+15	....	..	....	....	....	..
Etna, Pa. N2	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14
Fairless Hills, Pa. N5	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12
Fontana, Calif. K1	...	...	....	....	....	....	10.75	+6.5	13.75	+2.5	16.25	1
Ind. Harbor, Ind Y1	...	...	....	....	....	....	22.75	5.5	25.75	9.5	28.25	13
Lorain, O. N3	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14
Sharon, Pa. S4	25	+3.5	17	+8.5	9.5	+15	....	..	....	....	....	..
Sharon, Pa. M6	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14
Sparrows Pt., Md. B2	23	+5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12
Youngstown R2, Y1	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14
Wheatland, Pa. W9	23	+5.5	15	+10.5	7.5	+17	23.75	6.5	26.75	10.5	29.25	14

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.66		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	....	....	....
Alton, Ill. L1	30.25	14.25	30.75	14.75	32.25	15	32.25	15	....	....	....	....
Benwood, W. Va. W10	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Etna, Pa. N2	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Fairless Hills, Pa. N5	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Fontana, Calif. K1	19.25	2.25	19.75	3.75	21.25	4	21.25	4	12.5	+5.25	12.5	+5.25
Ind. Harbor, Ind. Y1	31.25	15.25	31.75	15.75	33.25	16	33.25	16	24.5	6.75	25.5	6.75
Lorain, O. N3	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	....	....	....
Sharon, Pa. M6	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	....	....	....
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R2, Y1	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75

*Galvanized pipe discounts based on current price of zinc (11.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	H.R. Strip	Shapes; H.R. & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.75	21.00	30.00	34.75	30.25	35.75	37.75	41.75	38.75
302	17.75	23.25	30.25	35.00	32.50	36.00	38.00	42.00	42.00
302B	19.00	25.00	31.00	35.00	35.50	36.00	38.00	45.25	45.25
303	....	25.25	32.75	37.75	....	38.75	40.25	46.00	46.00
304	19.00	24.50	31.75	36.75	35.00	36.00	40.50	44.50	44.50
304L	....	....	36.75	41.75	40.00	43.00	45.50	49.50	49.50
305	20.50	26.50	33.50	37.25	38.00	38.00	41.00	47.50	47.50
308	20.75	27.25	36.25	41.75	39.00	43.00	47.00	49.00	49.00
309	27.75	36.00	44.00	50.50	50.50	51.75	55.00	63.25	63.25
309S	29.75	38.75	48.00	55.75	55.25	56.75	60.25	69.75	69.75
310	55.00	45.25	56.75	66.25	64.75	69.50	71.00	74.25	74.25
314	....	....	....	....	....	....	71.00	....	....
316	25.75	35.00	48.25	56.25	54.00	57.25	60.50	64.50	64.50
316L	....	....	53.25	61.25	60.00	62.25	65.50	69.50	69.50
317	35.00	45.50	59.25	68.75	69.50	70.25	72.75	79.00	79.00
321	23.50	30.25	36.00	41.50	41.75	42.75	46.50	51.25	51.25
330	....	....	61.50	....	....	72.00	73.25	81.25	81.25
18-8CbTa	25.25	33.25	46.00	52.25	53.00	53.75	58.50	66.50	66.50
403	....	....	27.00	30.75	....	32.00	34.25	....	....
405	16.50	21.75	25.25	29.25	30.00	30.25	31.75	39.75	39.75
410	14.50	18.25	24.00	27.25	28.25	28.75	30.00	34.25	34.25
414	....	....	....	24.50	....	....	29.25	30.50	35.25
416	....	....	....	24.50	29.25	....	29.25	....	....
420	22.00	28.50	29.25	34.00	33.50	35.00	38.50	52.75	52.75
420	14.75	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F	....	....	25.00	28.75	....	29.75	....	....	....
431	15.00	19.25	25.00	28.75	28.00	29.75	....	35.75	35.75
446	....	....	33.50	38.25	50.25	39.50	40.75	59.75	59.75

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets Carbon Base 20%
Stainless:			
302	....	....	28.00
304	28.30	33.60	29.75
304-L	30.30	35.50	....
310	41.30	47.00	....
316	33.40	38.80	42.75
316-L	37.80	43.30	....
316-CB	38.90	45.50	....
321	30.00	35.30	34.25
347	32.20	38.60	44.25
405	23.90	31.10	....
410	23.40	30.60	....
430	23.40	30.60	24.25
Inconel	47.90	63.90	....
Nickel	39.50	54.10	....
Monel	40.80	54.80	....
L-Nickel	41.70	58.50	....
Copper*	....	....	46.00

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	29.60	37.15	25.75	33.55

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.26	5% Cr Hot Work	0.405
Extra Carbon	0.31-.315	W-Cr Hot Work	0.425
Special Carbon	0.37	V-Cr Hot Work	0.445
Oil Hardening	0.405	Hi-Carbon-Cr	0.73

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.630
18.25	4.25	1	4.75	...	2.245-2.415
18	4	2	9	...	2.615
18	4	2	....	...	1.705
18	4	1	....	...	1.540
14	4	2	5	...	2.185
13.75	3.75	2	5	...	2.185
13.5	4	3	....	...	1.805
9	3.5	..	....	...	1.115
6	4	2	....	5	1.045
6	4	3	....	6	1.290
1.5	4	1	....	8.5	0.909

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity,Ala. R3	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	56.50†	....
Gadsden,Ala. R2	52.38	52.88	....	....
Cincinnati, deld.	....	60.58	....	....
Buffalo District				
Buffalo H1, R2	56.00	56.50	57.00	57.50
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No.Tonawanda,N.Y. T9	....	56.50	57.00	57.50
Boston, deld.	66.65	67.15	67.65	....
Rochester,N.Y., deld.	59.02	59.52	60.02	....
Syracuse,N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Chicago R2	56.00	....	56.50	....
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee,deld.	58.17	58.67	58.67	59.17
Muskegon,Mich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7, R2	56.00	56.50	56.50	57.00
Akron,O. deld.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
NewYork, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Birdsboro,Pa. B10	59.00	58.50	....	....
Chester,Pa. C31	....	48.50	49.00	....
Philadelphia, deld.	....	50.16	50.66	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, deld.	59.66	60.16	60.66	61.16
Troy,N.Y. R2	58.00	58.50	59.00	59.50
Pittsburgh District				
NevilleIsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	57.87	57.87	58.37
McKeesRocks, deld.	....	57.54	57.54	58.04
Lawrenceville, Homestead, Wilmerding,Monaca, deld.	....	58.16	58.16	58.66
Verona,Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,SoDuquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C13	56.00	....	....	....

	Basic	No. 2 Foundry	Malleable	Bessemer
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O. deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	60.50	61.00	61.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T2	....	52.50*	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos, southern grade. †Phos, 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 28 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. G2, J1	$65.00
Buffalo H1	66.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.50 Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$80.50
Keokuk,Iowa, (Open-hearth & Fdry, freight allowed K3	85.00
Keokuk, O.H. & Fdry, 13½ lb pigiets, 16% Si, frgt allowed K3	88.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland A7 (Intermediate)	$61.00
Lyles,Tenn. T3	70.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, deld.	67.55
Troy,N.Y. R2	64.00

Warehouse Steel Products

Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 30 cents per 100 lb except Birmingham and St. Paul, 15 cents; Philadelphia, New York, Boston and Los Angeles, 10 cents; Buffalo, 25 cents on C.R. and galvanized sheets, C.F. and alloy bars and 20 cents on other commodities; Houston, Seattle, Spokane, Wash., no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302†‡	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.§	H.R. Alloy 4140†‡°		Carbon	Floor
Baltimore	6.02	7.51	7.79	....	6.69	...	6.68	8.53¹	12.54	6.72	6.37	7.78
Birmingham	6.35	7.35	8.25¹	....	6.60	...	6.50	9.10	....	6.65	6.65	8.45
Boston	7.20	8.23	9.53	45.25²	7.47	...	7.20	8.60	12.30	7.49	7.37	8.50
Buffalo	6.35	7.40	8.79	....	6.70	...	6.50	7.85	12.00	6.72	6.65	7.90
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.38	7.38	8.36	46.05	6.62	...	6.51	7.50	11.75	6.69	6.52	7.64
Cincinnati	6.49	7.37	8.30	46.10	6.86	...	6.75	7.80	12.00	6.86	6.81	7.89
Cleveland	6.38	7.38	8.25	46.16	6.72	...	6.57	7.60	11.81	7.02	6.69	7.81
Detroit	6.57	7.57	8.58	43.50	6.90	7.36	6.79	7.79	11.95	7.16	6.80	7.83
Erie, Pa.	6.35	7.38	8.30	....	6.70	...	6.50	7.45⁴	....	6.69	6.52	7.64
Houston	7.35	7.80	9.92	....	7.70	9.20	7.70	9.50	....	7.60	7.35	8.75
Los Angeles	7.50	9.35	9.95	50.15	7.85	11.75	7.45	10.15	13.15	7.65	7.45	9.55
Milwaukee	6.47	7.47	8.39	....	6.71	...	6.60	7.69	11.84	6.86	6.61	7.73
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.85	....	7.04	6.87	...
New York	6.97	7.91	8.79	44.95	7.56	...	7.37	8.73⁴	12.13	7.38	7.27	8.68
Norfolk, Va.	7.00	...	...	....	7.10	...	7.10	8.60	....	7.10	7.10	7.95
Philadelphia	6.19	7.44	8.26	41.98²	6.96	8.80	6.74	8.36⁴	11.96	6.54	6.49	7.51°°
Pittsburgh	6.38	7.38	8.30	46.00	6.72	...	6.51	7.85	11.75	6.69	6.52	7.64
Portland, Oreg.	7.20	8.25	8.90	48.50	7.45	...	7.30	10.45	14.00	7.25	7.05	8.95
Richmond, Va.	6.43	7.39	8.67	....	6.77	...	6.71	8.33	....	7.08	6.65	8.08
St. Louis	6.67	7.67	8.59	43.89	6.91	...	6.80	7.89	12.04	7.09	6.81	7.93
St. Paul	7.04	8.04	8.96	....	7.28	...	7.17	8.26	....	7.35	7.18	8.30
San Francisco	7.55	8.95	8.70	51.65	7.80	...	7.35	10.05	13.05	7.50	7.40	9.45
Seattle	8.10	9.80	10.15	51.00	8.20	...	7.80	10.95	13.50	7.75	7.80	9.60
Spokane	8.35	9.65¹	10.05	....	7.80	...	7.80	10.85‡‡	14.25	7.45	7.85	9.60
Washington	6.70	7.99	7.97	....	7.37	...	7.28	9.09	....	7.31	7.05	8.16

*Prices do not include gage extras; †prices include gage and coating extras, based on 11-cent zinc except in New York, Philadelphia, Los Angeles, Cincinnati, Cleveland, Pittsburgh, San Francisco (11.50-cent zinc) and in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extra; §as rolled; **¼-in. and heavier; ††as annealed; ‡‡prices include $2 for crating; §§under ¼-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb; stainless sheets, 5000 lb except in New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; ¹—500 to 9999 lb; ²—4000 lb and over; ³—1000 to 1999 lb; ⁴—1000 lb and over; ⁵—1500 to 3999 lb; ⁶—f.o.b. local delivery in lots of 10,000 lb and over.

Get Extra Sub-hearth

SAFETY AND LONGER LIFE

with Permanente Periclase D-S Brick

THIS superior brick has been *especially designed* to withstand sub-hearth conditions. Thus, it gives maximum protection against costly breakthroughs and provides longer sub-hearth life.

All the important properties outlined by major steel company ceramists as most desirable for sub-hearth brick are found in Permanente Periclase D-S Brick.

High MgO (more than 95%) is achieved through the use of pre-shrunk, accurately-sized Periclase grains derived from sea-water magnesia. Absence of chrome eliminates the reduction of chromium oxide and damage to the refractory structure. (Brick contains only 0.8% Cr_2O_3.)

Low iron content minimizes refractory damage from alternate oxidation and reduction of iron oxide and other iron compounds. Absence of calcium oxide prevents damage caused by slaking during slow heat-ups or while furnace is idle. (Brick contains only 0.6% Fe_2O_3 and 1.2% CaO.)

With all its many advantages, Permanente Periclase D-S Brick gives you the ultimate in sub-hearth safety and durability—*yet costs no more!*

Call or write Kaiser Chemicals Division, *Kaiser Aluminum & Chemical Sales, Inc. Regional Sales Offices: 1924 Broadway,* OAKLAND *12, California . . . First National Tower,* AKRON *8, Ohio . . . 518 Calumet Bldg., 5231 Hohman Avenue, Hammond, Indiana* (CHICAGO).

Kaiser Chemicals

Pioneers in Modern Basic Refractories

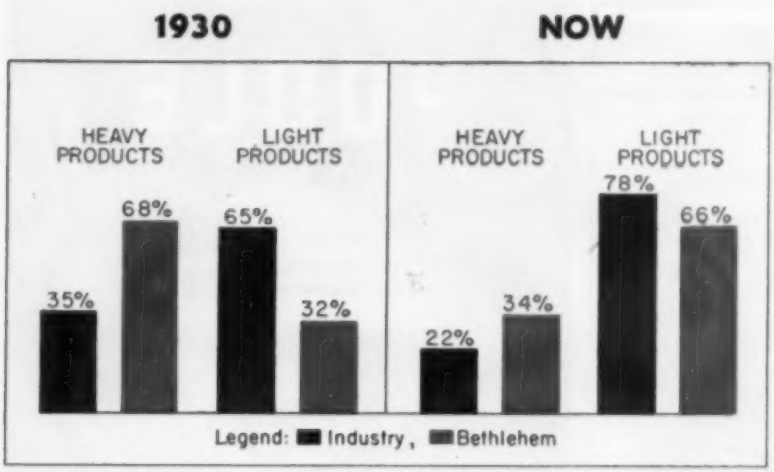
Basic Refractory Brick • Ramming Materials • Castables & Mortars • Magnesite • Periclase • Deadburned Dolomite

Permanente PERICLASE Brick for the Steel Industry:

- Permanente Periclase Brick (D-S)
- Permanente Periclase Chrome Brick (PCA)
- Permanente Chrome Periclase Brick (CPA)

Now available! A companion mortar for Permanente D-S brick. High purity periclase composition *and* maximum workability.

Installation advice on request



Bethlehem Reshapes Capacities Into Line with Steel Industry

LIGHT PRODUCTS are playing a heavier role in the steel industry.

That's emphasized by the changes Bethlehem Steel Co. has made in its product mix.

Bethlehem has been noted historically as a producer heavy in the heavy products like structurals and rails. In 1930, 68 per cent of its finishing capacity was for heavy products. In that year, only 35 per cent of the steel industry's shipments were heavy products (see accompanying chart).

Bethlehem's definition of heavy products is: Structural shapes and piling, plates, rails and rail accessories and other products.

A Contrast—That left only 32 per cent of Bethlehem's capacity in 1930 for the light products, compared with industry shipments of 65 per cent. Bethlehem's definition of light products is: Sheets and strip, tin and black plate, wire rods and wire and wire products, pipe and bars.

Steel usage has tended more and more to the light products. For instance, round tubing has supplanted the solid round bar in many uses.

Change of Pace—So, to get into step with this trend, Bethlehem increased the percentage of its light products to its heavy products. Where only 32 per cent of its finishing capacity in 1930 was for light products, it is now 66 per cent. The industry's shipments of light products in 1954 constituted 78 per cent.

Even though the percentage of heavy products has gone down, their tonnage has not. Bethlehem has boosted its total capacity to a little more than twice that of 1930.

Although Bethlehem's total capacity for heavy products has not gone down, some individual heavy items have. In 1930, it had 1,160,000 net tons of capacity for railroad rails and rail accessories. Now, that capacity is only 660,000 tons.

Big Switch—Biggest increase has been in capacity for sheets and strip. In 1930, Bethlehem could produce only 170,000 tons of them, compared with 4,360,000 tons now.

How Bethlehem's finishing capacities have changed in the last quarter of a century is shown in the accompanying table.

How Bethlehem Steel's Finishing Capacities Have Changed

(Net tons)

	Jan. 1, 1955	Jan. 1, 1946	Jan. 1, 1930
LIGHT PRODUCTS:			
Sheets and strip	4,360,000	1,520,000	170,000
Tin and black plate	1,320,000	640,000	230,000
Wire rods, wire and wire products	950,000	540,000	310,000
Pipe	580,000	270,000	200,000
Bars	2,720,000	1,920,000	1,350,000
Total	9,930,000	4,890,000	2,260,000
HEAVY PRODUCTS:			
Structural shapes and piling	2,570,000	2,110,000	1,890,000
Plates	1,400,000	1,070,000	920,000
Rails and rail accessories	660,000	980,000	1,160,000
Other products	540,000	650,000	810,000
Total	5,170,000	4,810,000	4,780,000
Grand Total	15,100,000	9,700,000	7,040,000

Stainless Steel . . .

Stainless Steel Prices, Page 168

Washington Steel Corp., Washington, Pa., plans installation of a 48-in. Sendzimir cold-rolling mill and collateral equipment to enlarge its facilities for production of stainless steel sheet and strip.

Flat-rolled stainless product sales are excellent. Other products are slower, but improvement is noted in wire and bar demand. Mills are operating at capacity on flat-rolled, with no sign of a slowdown in demand. Defense demand is slow. .

Sheets, Strip . . .

Sheet & Strip Prices, Pages 165 & 166

Recently there has been a tendency among some sheet buyers not to go all out and too far ahead in their ordering. They are less worried about a strike in the steel industry owing to a dispute over wages than they are about one in the automotive industry over the guaranteed annual wage. In the event of automotive labor trouble a rapid easing in sheet supply could be expected.

Cold-rolled sheet tonnage is still available for shipment in May. Some producers have little left for the second quarter, however, especially when set asides for regular customers are considered. Hot-rolled deliveries are becoming more extended, now ranging to May in some cases. More continuous hot-dipped galvanized sheet tonnage has been booked for the third quarter but non-continuous galvanized still is available for May delivery.

Stainless strip deliveries are much further extended than are stainless sheet shipments. One large producer, for instance, is quoting 10 to 12 weeks on strip as against 4 to 6

Wide Range Work on
SEMCO'S WIDE RANGE PRESS BRAKES

All are low priced with features you would expect in much costlier presses.

- All Steel Welded Construction
- Heavy Alloy Forged Steel Pitmans with Buttress Threads
- Anti-friction and Bronze Bearings Throughout
- Eccentric Shafts are Heat Treated Alloy Steel Forgings
- Double geared and Twin driven for balanced distribution of power

Extras at no extra cost . . .

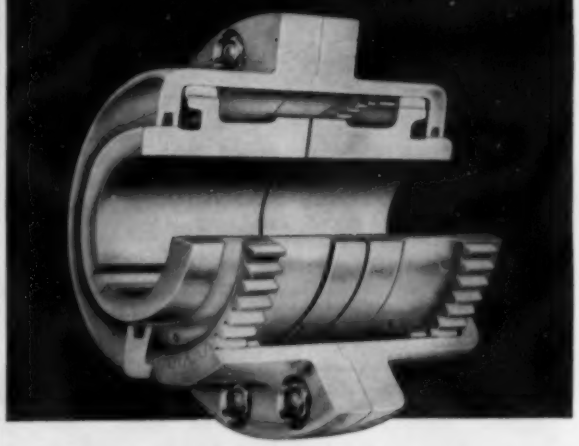
- 3" Stroke, 12" Shut Height

Send for NEW catalog illustrating newest models of Press Brakes and including Standard 90 Carbon Forged Steel Press Brake Dies.

SEMCO
SERVICE MACHINE CO., INC.
ESTABLISHED 1919

154 Miller St. Elizabeth 4, N. J.

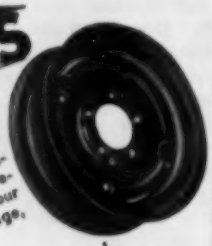
POOLE



A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST.

FLEXIBLE COUPLINGS
POOLE FOUNDRY & MACHINE COMPANY WOODBERRY, BALTIMORE, MD.

F&H for MOBILITY at its BEST
WHEELS



Meet your wheel problems with "WHEELS by French & Hecht." Our experience, facilities and "Know-How" are your assurance of matured and tested recommendations—as well as wheel-hub-spindle-bearing assemblies perfectly suited to your requirements. In ONE engineered package, we offer you—

DESIGN of Wheels and HUBS
•
DESIGN of SPINDLES and AXLES
•
SELECTION of ADEQUATE BEARINGS
•
SELECTION of Suitable Closure SEALS
•
SELECTION of Sizes, Types, Rubber TIRES

We Invite Your Inquiries

OUR PACKAGE PLAN
Our PACKAGE PLAN can save you Research, Development and Tooling Costs.

FRENCH & HECHT
DIVISION
KELSEY-HAYES WHEEL COMPANY
DAVENPORT, IOWA

C

ELECTRIC FURNACE
STEEL CASTINGS
ARE FOUNDRY ENGINEERED

Regardless of the type of product you make — if you are interested in strength, toughness, uniform structure, resistance to fatigue, long life, lower machining and lower assembly costs — you'll be interested in C Steel Castings. The point is that they are sound, clean, true to pattern castings that by alloy and heat treating possess an almost unlimited range of mechanical properties.

Why Not Investigate?

Perhaps by cooperating with your engineers in details of design and pattern construction we may be able to save you both machining and assembling costs.

CRUCIBLE STEEL CASTING CO.
LANSDOWNE, PENNA.

on sheets. Appliance makers are doing well, maintaining requirements for enameling stock. In New England, pressure for automotive shipments of cold-rolled sheets is shunting aside some tonnage due other users. On several products, including enameling stock, some producers are booking only for two months of the second quarter.

Tin Plate . . .

Tin Plate Prices, Page 166

Mills are building up stocks in anticipation of heavy orders later this month. Shipments are increasing, but much current production is for mill inventories. Some mills are working at nearly 100 per cent of capacity.

With stocks of tin plate substantial and demand for containers normal for this season, platemakers would like to divert temporarily some ingot tonnage allocated to tin plate to other products now under pressure. Canmakers, however, insist upon no deviation from established schedules.

Steel Bars . . .

Bar Prices, Page 164

Trading in hot-rolled carbon bars is at a fairly good clip. Deliveries average about four weeks. Also, there is some betterment in hot-rolled alloys, though, relatively, demand is not so active as in the carbon grades.

Auto requirements lead. However, there is some acceleration in agricultural equipment and construction machinery needs; also, demands from warehouses. Cold-drawers report better tonnage movement to the distributors, especially in the carbon grades. In New England, defense requirements, mostly small arms, account for steady demand for alloys.

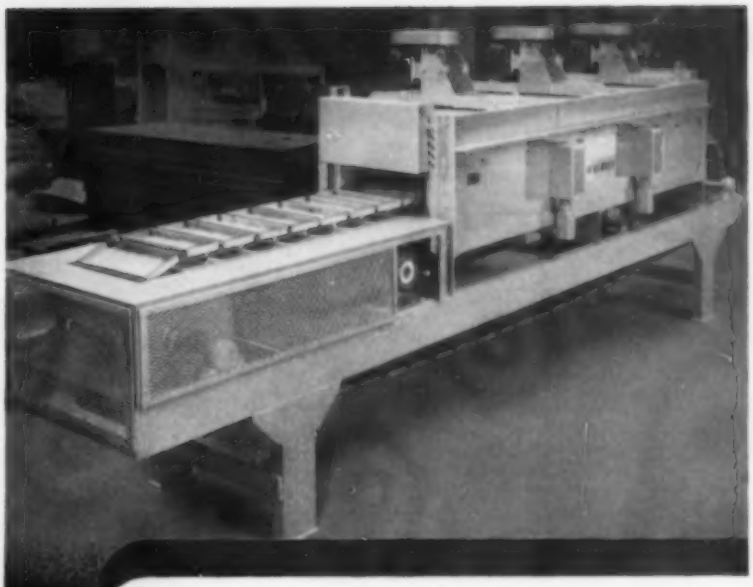
Deliveries have not become extended to the point consumers are laying in excess supplies, but they are building up inventories to a greater extent than when they could obtain prompt mill shipments.

Wyckoff Steel Co., Pittsburgh, has revised its extras on bars, effective Feb. 24. The revisions include increases in quantity charges for rounds, squares and hexagons.

Plates . . .

Plate Prices, Page 164

While plate business is better than it was a few weeks back, it still can't be described as brisk. Delivery promises average around three to four weeks with one Atlantic seaboard mill quoting six weeks. Consumers of tank plate, however, can still get shipments in two weeks by shopping around. At the same time, a Pitts-



Specially Designed
for Continuous Production

HEVI DUTY

CONVEYOR FURNACE

Of special design for Kohler Co. of Kohler, Wisconsin, this Hevi Duty Conveyor Furnace is being used to heat aluminum and brass billets prior to forging jet engine and other parts. Not only has this furnace been designed for a specific job, but Hevi Duty Engineers also built into this furnace many additional features.

- Notice the three fans which speed the heating of the billets by circulating the heated air, and also assure a uniform temperature in the heating chamber. With this feature, a smaller, more economical furnace is able to do this production job.
- Heat resistant alloy conveyor links and trays mean years of dependable service.
- Versatility . . . by using a variable speed drive to adjust the conveyor speed, this furnace can be used for annealing, tempering, and other heating operations.

Special Hevi Duty Furnaces can be engineered to your specifications and your production system. Let us know your requirements. Our engineers will work with you.

HEVI DUTY ELECTRIC COMPANY
MILWAUKEE 1, WISCONSIN
Heat Treating Furnaces . . . Electric Exclusively
Dry Type Transformers Constant Current Regulators

Silent Hoist gave you ***KRANE KAR***, the first modern Mobile Crane . . . Front-Wheel Drive . . . Stability without Stabilizers . . . Lifetime Front Axle . . . Automatic Safety Controls. And now ***Silent Hoist*** gives you **FLUID DRIVE!**

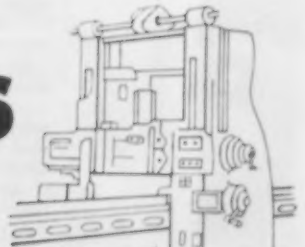
- Increases engine clutch life.
- Provides cushioned starting and acceleration.
- Eliminates overload shock damage to drive gears.
- Speeds operation.
- Cuts maintenance drastically.

Ask for Bulletin No. 79C

"Silent Hoist" *KRANE KAR* Swing-Boom Mobile Crane . . . 1½, 2½, 5, 10, 12½ Ton Capacities

SILENT HOIST & CRANE CO.
Pioneer Mfrs. of Heavy Duty Materials-Handling Equipment
849 63rd Street, Brooklyn 20 N Y

LET SIMMONS REBUILD AND MODERNIZE YOUR PLANERS



Investigate the important production, maintenance and tax savings of SIMMONS ENGINEERED REBUILDING for your: Lathes, Planers, Surface Grinders, Cylindrical Grinders, Vertical Millers, Openside Planers, Automatics, Vertical Boring Mills, Turret Lathes and Radial Drills.

A qualified Simmons rebuilding engineer will discuss it with you. Write, wire or phone today. Simmons Machine Tool Corporation, 1755 North Broadway, Albany 1, N. Y.

Write for Simmons Way... case histories of rebuilding jobs.

SIMMONS GIVES MACHINE TOOLS A NEW LEASE ON LIFE
Unconditional guarantee . . . our standard since 1910

burgh producer is predicting more extended deliveries by the end of this month. An order placed with this mill today can't be filled until late April.

Improvement in the plate market largely reflects a general pickup in demand rather than outstanding activity in any one field. Construction requirements are increasing, and line pipe projects are providing substantial volume. Large diameter welded steel pipe is absorbing more plate tonnage, contributing to the slightly extended deliveries.

Some trade interests think tighter supply conditions, in some measure, are attributable to the absence of strip-plate tonnage in the market.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

5300 tons, bridge superstructure, contract No. 2, Missouri river bridge at Broadway, Kansas City, Mo., to American Bridge Division, U. S. Steel Corp., Pittsburgh, $2,640,950, bids Feb. 15.

3600 tons, crushing plant, Erie Mining Co., Aurora, Minn., to Bethlehem Steel Co., Bethlehem, Pa.

2300 tons, concentrator platform, Erie Mining Co., Emco, Minn., to Bethlehem Steel Co., Bethlehem, Pa.

1725 tons, nine-span stringer Quaboag Valley bridge, Massachusetts turnpike, Palmer-Brimfield, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Gilbane Building Co., Providence, R. I., general contractor.

1625 tons, ten bridges, Massachusetts turnpike, Grafton-Upton-Westboro-Hopkington, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.; Gilbane Building Co., Providence, R. I., general contractor; also 990 tons, reinforcing bars.

1245 tons, seven bridges, Massachusetts turnpike, Charlton-Oxford-Auburn, Mass., to Harris Structural Steel Co., New York, through Munroe-Langstroth Inc., Norwood, Mass., subcontractor for bridges.

1115 tons, five bridges, Massachusetts turnpike, Palmer, Mass., to Ernst Iron Works, Buffalo, N. Y.; Grand View Construction Co., Mt. Vernon, N. Y., general contractor.

955 tons, five bridges, Massachusetts turnpike, Sturbridge-Charlton, Mass., to West End Iron Works, Cambridge, Mass., through Munroe-Langstroth Inc., Norwood, Mass., subcontractor for bridges.

918 tons, state turnpike bridges, Luzerne county, Pa., through Badgett Mining & Stripping Co., Kentucky, to American Bridge Division, U. S. Steel Corp., Pittsburgh.

800 tons, trunnion-type drawbridge, Malden river, Malden-Everett, Mass., to American Bridge Division, U. S. Steel Corp., Pittsburgh, through Munroe-Langstroth Inc., Norwood, Mass., general contractor.

625 tons, school, Ellenville, N. Y., through Mar-Mes Construction Co., general contractor, to White Plains Iron Works, White Plains, N. Y.

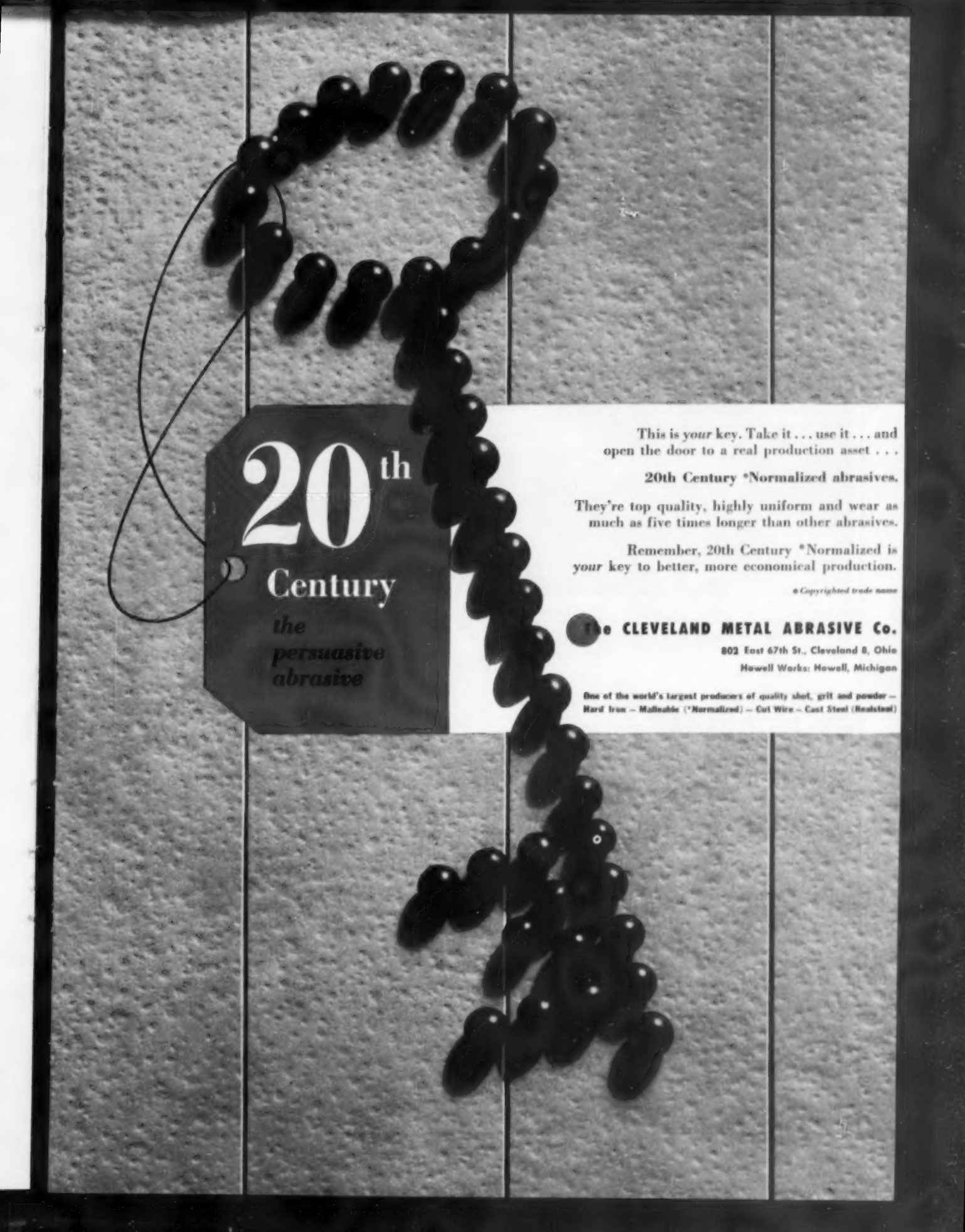
520 tons, buildings Nos. 1 and 2, International Business Machines Corp., Poughkeepsie, N. Y., through Turner-Campbell, general contractor, to Bethlehem Fabricators, Bethlehem, Pa.

375 tons, two motor freight terminals, Adley Express Co., Stratford, Conn., and Springfield, Mass., to New England Iron Works, New Haven, Conn.; Leo F. Caproni & Associates, New Haven, consulting engineers.

300 tons, theater, American Shakespearean Festival Academy, Stratford, Conn., to Berlin Construction Co.; Leo McManus Construction Co., Danbury, Conn., general contractor.

300 tons, shapes and bars, faculty apartments, University of Connecticut, Storrs, Conn., to United Iron Works, Providence, R. I. (structurals); Scherer Steel Co., Hartford, Conn. (reinforcing); Anderson Fairoaks Con-

(Please turn to page 178)



This is *your* key. Take it . . . use it . . . and open the door to a real production asset . . .

20th Century *Normalized abrasives.

They're top quality, highly uniform and wear as much as five times longer than other abrasives.

Remember, 20th Century *Normalized is *your* key to better, more economical production.

** Copyrighted trade name*

The CLEVELAND METAL ABRASIVE Co.

802 East 67th St., Cleveland 8, Ohio

Howell Works: Howell, Michigan

One of the world's largest producers of quality shot, grit and powder — Hard Iron — Malleable (*Normalized) — Cut Wire — Cast Steel (Reasteel)

Current Ferroalloy Quotations

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si), Carlot per gross ton $56, Palmerton, Pa.; $67 Clairton and Duquesne, Pa.
(16 to 19% Mn) $54 per ton, Palmerton, Pa.; $55 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.). Base price per net ton $190, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, Philo, O.; Sheffield, Ala.; Portland, Oreg., and Tacoma, Wash. Add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $196 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max, 0.07% C, 29.95c per lb of contained Mn, carload packed 30.7c, ton lots 31.8c, less ton 33c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max, 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.06c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carloads, 30c; 2000 lb to min carloads, 32c; 250 lb to 1999 lb 34c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-65%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed 11.75c, ton lots 12.65c, less ton 13.80c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.35c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 5% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.ob. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload lump, bulk, C 0.025% max. (Simplex 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 26-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 15.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 12c per pound of contained silicon; 1" x down, bulk 24.90c per pound of contained chromium plus 12.2c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe). Contract, 1" x D; packed, max 0.50%, carload $1.16, ton lots $1.18; less ton $1.20. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 9c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth. Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 50-55%, Si 2-3.5% max, C 0.5-1% max). $3.10. **Primos and High Speed Grades** (V 50-55%, Si 1.50% max C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12c per lb of contained Si, carload packed 13.6c, ton lot 15.00c, less ton 16.7c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per pound contained silicon; carload packed 14.85c; ton lots, 16.05c; less ton, 17.4c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.4c per lb of contained Si, carload packed 15.7c, ton lot 16.85c, less ton 18.1c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 17.25c per lb of contained Si, carload packed 18.45c, ton lot 19.4c, less ton 20.45c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe). C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 25.25c per lb of alloy, ton lot 26c, less ton 27.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min M) $1.50.

Boronil: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) Contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.05c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 11.65c per lb of briquet, c.l. packaged 12.55c, ton lot 13.65c, less ton 14.55c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.45c per lb of briquet, c.l packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.55c per lb of briquet. Packed c.l. 7.55c, ton lot 8.35c, less ton 9.25c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.7c. Packaged c.l. 7.7c, ton lot 8.5c, less ton 9.4c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 55-60%, Si 5% max, C 0.4% max). Contract, ton lot, 2" x D, $12 per lb of contained Cb, less ton $12.65. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $6.25 per lb of contained Cb plus Ta, deld.; less ton lots $6.30.

Silicax Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ¼" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%), C.l. packed, 17.50c per lb of alloy, ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 16.6c per lb of alloy; ton lots 18.10c; less ton lots 19.35c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Siminal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 15.50c. Packed c.l. 16.50c, 2000 lb to c.l. 16.75c, less than 2000 lb 17.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Elgio, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb containers, f.o.b. Langeloth, Pa., $1.46 in all sizes except powdered which is $1.57; Washington, Pa., furnace, any quantity, $1.46.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.25 in cans; in bags, $1.24, f.o.b. Langeloth, Pa.; Washington Pa., $1.24.

COPPER DETERMINATION

Alloymet 2030 (65% Nickel 30% Copper 5% Iron)*

A product of close Metallurgical CONTROL
for the production of low alloy steel and gray iron

Pre-alloyed master alloys are leaving an indelible mark on the iron and steel industry. The element of human error is reduced many fold, since a single alloying agent, *ALLOYMET* 2030 ingot or shot, can replace many separate inoculants. A single trial of Alloymet 2030 or its companion alloys will make you an "Alloymet regular."

For further information, write us for our booklet, "Master Alloys."

*Nominal Chemical Composition

ALTER COMPANY
Alloy Metal Division
1701 Rockingham Road, DAVENPORT, IOWA
Phone 6-2581 Teletype DV 588

(*Concluded from page 174*)

struction Co., Hartford, Conn., general contractor.

290 tons, infirmary, state hospital, Rome, N. Y., through F. D. Rich Inc., general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

245 tons, state bridges, Carbon county, Pa., to Anthracite Bridge Co., Scranton, Pa.

245 tons, office and research laboratory, Minerals & Chemicals Corp. of America, Woodbridge township, N. J., to Elizabeth Iron Works, Elizabeth, N. J.

230 tons, state highway, route 4-B, section C, Bergen and Passaic counties, N. J., to Allied Steel Products Co., Kenilworth, N. J.

200 tons, additional contract for refinery structures, Shell Oil Co., Anacortes, Wash., to Pacific Car & Foundry Co., Seattle.

190 tons, pipe columns, substructure, state turnpike, N-23, Jersey City, N. J., through the Western Foundation Co., general contractor, to Albert Pipe Supply Co., Brooklyn, N. Y.

135 tons, plant addition, Grinnell Co., Philadelphia, to Cantley & Co., Philadelphia.

100 tons, steel joists, Ft. Lewis, Wash., housing project, to Southwest Steel Products Inc., Houston, Tex.; J. W. Bateson, Dallas, Tex.

STRUCTURAL STEEL PENDING

8000 tons, State street bridge, Connecticut river, Hartford-East Hartford, Conn.; taking bids on substructure Mar. 31, Hartford; superstructure late this year.

1815 tons, 11 bridges, Massachusetts turnpike, Framingham-Natick-Wayland, Mass.; bids Mar. 10, Boston.

1125 tons, 12 bridges, Massachusetts turnpike, Westfield-West Springfield, Mass.; bids Mar. 16, Boston.

1050 tons, state bridge work, Camden county, N. J., Brewster Contracting Co., Union, N. J., low on general contract.

800 tons, trunnion-type draw-bridge, Malden river, Everett-Malden, Mass.; Munroe-Langstroth Inc., Norwood, Mass., low on general contract at $1,721,123.

745 tons, six bridges, Massachusetts turnpike, Grafton-Millbury, Mass., Gilbane Building Co., Providence, R. I., low on general contract; also 715 tons, reinforcing.

630 tons, roof supports, T. J. Evans tunnel, state turnpike, Lehigh and Carbon counties, Pa.; Lipsett Inc., Philadelphia, low on general contract.

600 tons, approach work on Pennsylvania side of Philadelphia-Gloucester bridge, Delaware River Port Authority, bids Mar. 10.

360 tons, three bridges, Massachusetts turnpike, Brimfield-Warren, Mass.; bids Mar. 8, Boston.

320 tons, three bridges, Massachusetts turnpike, Becket-Otis, Mass.; Elmhurst Contracting Co., Corona, N. Y., low on general contract.

315 tons, four state bridges, Manchester, N. H.; bids Mar. 11, Concord, N. H.

165 tons, seawall, Hampton, N. H.; also 2120 tons, steel sheet piling and 50 tons, reinforcing bars.

120 tons, state bridge, Cambria county, Pa., bids Apr. 1.

REINFORCING BARS . . .

REINFORCING BARS PLACED

540 tons, nine-span stringer bridge, Massachusetts turnpike, Palmer-Brimfield, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Gilbane Building Co., Providence, R. I., general contractor.

100 tons, three-span continuous plate girder bridge, Farmington river, East Granby-Simsbury, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; Brunalli Construction Co., Southington, Conn., general contractor.

REINFORCING BARS PENDING

2500 tons, Alaska railroad $4.4-million deep water terminal, Seward, Alaska; bids in early April.

1650 tons, 12 bridges and 6 culverts, Massachusetts turnpike, Westfield-West Springfield, Mass.; also 210 tons steel sheet piling; bids Mar. 16, Boston.

1165 tons, 11 bridges, Massachusetts turnpike, Framingham-Natick-Wayland, Mass.; bids Mar. 10, Boston.

525 tons, five bridges, Massachusetts turnpike, Palmer, Mass.; Grand View Construction Corp., Mt. Vernon, N. Y., low on general contract.

290 tons, three bridges and culvert, Massachusetts turnpike, Brimfield-Warren, Mass.; bids Mar. 8, Boston.

190 tons, four state bridges, Manchester, N. H.; bids Mar. 11, Concord, N. H.

130 tons, post stockade and guard house, Ft. Lewis, Wash.; also 13 tons, shapes; bids to U. S. Engineer, Seattle, about Mar. 21.

110 tons, widening Dorchester Bay bridge, Boston; F. E. Daddario Corp., Boston, low; also 85 tons, structural steel.

PLATES . . .

PLATES PENDING

900 tons, Navy Purchasing Office, invitation 816 and 817, Washington; bids Mar. 11.

137 tons, including sheet piling, Kenai, Alaska; Morrison-Knudsen Co., Seattle, low.

100 tons, half-million-gal water tank; bids to Kennewick, Wash., Mar. 15, Marjorie Miller, clerk; Carey & Kramer, Seattle, engineers.

PIPE . . .

STEEL PIPE PLACED

2170 tons, large diameter steel pipe, Erie Mining Co., Aurora, Minn., to Bethlehem Steel Co., Bethlehem, Pa.

RAILS, CARS . . .

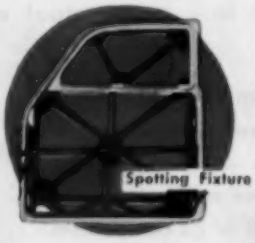
RAILROAD CARS PLACED

Chicago & Great Western, 1001 freight and caboose cars, placed as follows: 750 seventy-five ton ore cars to the Johnstown, Pa. plant of the Bethlehem Steel Co.; 226 fifty-ton box cars to the Michigan City, Ind., plant of Pullman-Standard Car Mfg. Co., Chicago; 25 steel caboose cars to the Kenton, O. plant of the International Railway Car Co.

Engineered... To YOUR *Tooling NEEDS*

Ren-ite*, the great dimensionally stable tooling plastic, has been tested and proved by years of research and development. The Ren-ite organization offers unrivaled facilities to help industry cut up to 70% tooling time and 50% of costs.

You can be SURE when you use Ren-ite modified epoxy resins for master Keller models, skin panels, checking and welding fixtures, dies and prototypes, or other tooling applications.



Spotting Fixture

Automobile Hood Duplication

Some of the many uses of Ren-ite tooling plastic and standard stock plastic tubing.

● FREE ENGINEERING SERVICE—NO CONTRACTS REQUIRED

Write for illustrated brochure and complete price schedules.

Ren•ite PLASTICS, INC.

POST OFFICE BOX NO. 1256, LANSING 4, MICH.
OFFICES IN CHICAGO, CLEVELAND, DETROIT, LOS ANGELES, NEW YORK AND ST. LOUIS.

*"Ren-ite," "The Dimensionally Stable Tooling Plastic" and "Comminuted for Quality" are Trademarks of Ren-ite Plastics, Inc.

STEEL-BRASS and ALUMINUM STAMPINGS

Looking for a dependable source of supply to keep an un-interrupted flow of parts coming in on scheduled time? Our reputation is behind every promise date. Send blueprints or samples for quotation.

WORCESTER STAMPED METAL CO.
Established 1883
10 HUNT STREET • WORCESTER, MASS.

COST JUST A FRACTION OF METAL SPACERS

THE COLOR TELLS THE THICKNESS

ALWAYS RETAINS UNIFORMITY AND EVENNESS UNDER ALL NORMAL CONDITIONS

ARTUS PLASTIC SLITTING MACHINE SHIMS

Save Time! Save Money!

INDUSTRIAL PRODUCTS SUPPLIERS 201 South Dean Street Englewood N. J.

Ores

Lake Superior Iron Ore

(Prices effective for the 1955 shipping season; gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Old range (Gogebic) bessemer $10.50
Old range (Gogebic) nonbessemer 10.35
Old range (Marquette) blast furnace 10.25
Mesabi bessemer 10.25
Mesabi nonbessemer 10.10

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract 17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60-68% 20.00
N. African hematite (spot)...nom. 20.00-22.00
Brazilian iron ore, 68-69% (spot) 25.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good comercial quality ..... $25.00-$26.00
Domestic, scheelite, mine 63.00

Manganese Ore

Mn 48%, nearby, 90c-92c per long ton unit c.i.f. U. S. ports, duty for buyer's account, 46-47%, 80c.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1 .....nom. $40.00-$42.00
48% 3:1 .....42.00-44.00
48% no ratio 32.00-34.00

South African Transvaal

44% no ratio .....$19.00-$20.00
48% no ratio 31.00-32.00

Domestic

Rail nearest seller

18% 3:1 .....$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked $1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60% ..... *$3.25-$3.80*
65% *4.15-4.25*

Vanadium Ore

Cents per lb, V_2O_5 content, deld. mills

Domestic 31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Pueblo, Colo., $94; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $114; Salina, Pa., $119; Niles, O., $125; Los Angeles, Pittsburg, Calif., $137.20.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $120; Warren, Niles, O., Hays, Pa., $125; Morrisville, Pa., $123.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $130; Cutler, Utah, $121.55; Los Angeles, $127.85.

Super Duty: Hays, Sproul, Pa., Warren, Windham, O., Athens, Tex., $137; Morrisville, Pa., Niles, O., $140; Joliet, Ill., $143.

Semisilica Brick (per 1000)

Clearfield, Pa., $130; Woodbridge, N. J., $114.

Insulating Fire Brick (per 1000)

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick (per 1000)

Dry Pressed: Bessemer, Ala., $64.80; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $77.50; Wellsville, O., $81.50; Clearfield, Pa., Portsmouth, O., $87; Peria, Ark., $100; Los Angeles $110.25; Pittsburg, Calif., $111.30.

High-Alumina Brick (per 1000)

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $181; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $225; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $260; Danville, Ill., $258; Clearfield, Pa., $267.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $147; Clearfield, Pa., $146.50; St. Louis, $159.30; Athens, Tex., $155.

Nozzles (per 1000)

Reesdale, Pa., $234.70; Johnstown, Pa., $240.70; Clearfield, Pa., $241.40; St. Louis, $259.45; Athens, Tex., $247.70; Bridgeburg, Pa., $267.50.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $183.50; Clearfield, Pa., $185.50; St. Louis, $195.80; Athens, Tex., $191.80.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Nario, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $15.10; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite (per net ton)

Domestic, dead-burned bulk, ¼-in. grains with fines: Luning, Nev., Chewelah, Wash., $38.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace .....$13.50-$14.00
Connellsville, foundry 16.50-17.00

Oven Foundry Coke

Kearny, N. J., ovens $24.00
Everett, Mass., ovens
New England, deld. *26.05
Chicago, ovens 24.50
Chicago, deld. 26.00
Terre Haute, Ind., ovens 24.05
Milwaukee, ovens 25.25
Indianapolis, ovens 24.25
Cincinnati, deld. 25.85
Painesville, O., ovens 25.50
Cleveland, deld. 27.43
Erie, Pa., ovens 25.00
Birmingham, ovens 22.65
Cincinnati, deld. 27.58
Buffalo, ovens 25.00
Buffalo, deld. 26.25
Lone Star, Tex., ovens 18.50
Philadelphia, ovens 23.00
Swedeland, Pa., ovens 23.00
St. Louis, ovens
St. Louis, deld. 26.00
St. Paul, ovens 23.75
Portsmouth, O., ovens 24.00
Cincinnati, O., deld. 26.62
Detroit, ovens 25.50
Detroit, deld. 26.50
Pontiac, deld. 27.06
Saginaw, deld. 28.58

*Or within $4.65 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol 36.00
Toluol, one deg. 32.00-35.00
Industrial xylol 32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia .....$42-$45
Birmingham area .....42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars 18.00
c.l. drums 19.00
l.c.l. drums 19.50

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $35-$36; 70%, $32-$33; 60%, $28-$29. Imported, net tons, duty paid, metallurgical grade: European, $28-$30; Mexican, $25.50.

Electrodes

Threaded with nipple, unboxed, f.o.b. plant

GRAPHITE

Diam	Length	Per 100 lb
2	24	$47.75
2½	30	30.75
3	40	30.00
4	40	28.50
5½	40	28.25
6	60	25.50
7	60	25.25
8, 9, 10	60	22.75
12	72	26.00
14	60	22.50
16	72	21.50
17	60	22.00
18	72	21.50
20	72	21.25

CARBON

8	60	11.40
14, 12, 10	60	11.10
14	72	10.25
17	60	10.25
17	72	9.85
20	54	9.85
20	90	9.65
24	72, 84	9.85
24	96	9.60
30	84	9.75
40, 35	110	9.50
40	100	9.50

BOTH AC and DC WELDING CURRENT FROM ONE WELDER

New Lincoln Idealarc has soft arc and forceful arc with arc-booster starting on both AC and DC

With Lincoln's new Idealarc welder, you have complete freedom of choice in selecting the best type of arc for any job. You can choose AC or DC, whichever gives the best results. Then you can select a soft arc or forceful arc depending on position, type of electrode and weld appearance.

For the first time, shops that do not have 3 phase power can now use DC welding. Idealarc operates from single phase power.

Arc-booster starting is provided on DC as well as AC. This assures non-sticking operation, easier intermittent welding, complete penetration at the start of each weld.

LINCOLN IDEALARC

In One Machine—AC and DC
Soft arc and forceful arc in both AC and DC
Arc Booster Starting in both AC and DC

SEND FOR BULLETIN 1343 ON LINCOLN IDEALARC Write:

THE LINCOLN ELECTRIC COMPANY
Dept. 1602
Cleveland 17, Ohio
THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT

FREE BOOKLET
... see how diamond can cut your finishing costs ... how to use diamond most economically
Finish with diamond...
Elgin Diamond!

ELGIN Diamond

...another famous-for-quality ELGIN Product

Precision graded in Elgin's own laboratories and scientifically compounded for maximum abrasive efficiency ... recognized as the standard for diamond abrasive quality. Elgin Diamond saves hours of finishing time more precious than diamond itself. Write today for your copy of "Finish with diamond" ELGIN DIAMOND

ABRASIVES DIVISION, DEPT. E

ELGIN NATIONAL WATCH COMPANY

ELGIN, ILLINOIS

MORE SCRAP MOVES FASTER from PILE to BALER WITH OWEN GRAPPLES

and with a lower operating cost, too. Widespread acceptance by scrap handlers everywhere, based on performance exceeding all other scrap handling methods, makes it imperative that you INVESTIGATE OWEN SCRAP GRAPPLES.

THE OWEN BUCKET COMPANY
BREAKWATER AVE. • CLEVELAND, OHIO
Branches: New York, Philadelphia, Chicago, Berkeley, Calif. Fort Lauderdale, Florida

OWEN NEW METHOD SCRAP HANDLING

for Corrugating and Complete Line of Culvert Equipment—Slitting and Coiling Equipment for Ferrous and Non-Ferrous Material in All Capacities—Warehouse and Steel Mill Cut to Length Lines for Shearing and Levelling Sheets from Coils—Shears for Shearing Sheets and Plates Both Underdriven and Overdriven Types in Capacities to 1¼" Plate.

STAMCO. Inc., New Bremen, Ohio

The Cleveland Steel Tool Co.

• PUNCHES • DIES • CHISELS • RIVET SETS •

IF IT'S *RIVETED* YOU *KNOW* IT'S SAFE

•

WE FEATURE SPECIAL PUNCHES & DIES

660 E. 82nd ST., CLEVELAND, O.

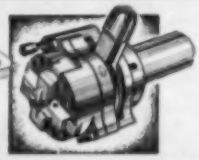
STEEL TUBING

SEAMLESS or WELDED
AIRCRAFT • MECHANICAL
PRESSURE • STAINLESS
STAINLESS PIPE & FITTINGS

SERVICE STEEL

DETROIT • BUFFALO • CHICAGO • CINCINNATI • LOS ANGELES

H&G Insert Chaser DIE HEADS



famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

THE EASTERN MACHINE SCREW CORP., 22-42 Barclay Street, New Haven, Conn.
Pacific Coast Representative: *A. C. Berbringer, 334 N. San Pedro St., Los Angeles, California.* Canada: *F. F. Barber Machinery Co., Toronto, Canada.*

So many standard styles. . . . . .

. . . . . one must be just right for you!

For more than 66 years we have been producing metal-working tools and adding to our standard line. Today we keep such an extensive range of styles and sizes of PUNCHES and DIES on hand that we can fit most makes of punch presses from stock. The tools you need are immediately available when you need them—at regular low, standard prices.

SEND FOR OUR COMPLETE CATALOG SHEETS

SEE HOW YOU CAN SAVE WITH LEWTHWAITE TOOLS

T. H. LEWTHWAITE MACHINE CO., INC.

310 East 47th Street, New York 17, N. Y.

PERFORATED METALS
TO YOUR REQUIREMENTS
FOR
ALL INDUSTRIAL USES
ARCHITECTURAL GRILLES
SEND FOR CATALOG NO. 39
DIAMOND MFG. CO.
BOX 32 WYOMING, PA.

Scrap . . .

Scrap Prices, Page 183

Philadelphia—While the market undertone is strong, scrap trading has leveled off. Prices have advanced only on a few items the past week. Low phos structurals and plate are higher at $42-$43, delivered; couplers, springs and wheels at $42.50; and No. 1 cupola cast at $35-$38. Short shovel turnings, recently quoted nominally at $25.50, delivered, are moving well at that level.

Boston—Based mostly on buying for eastern Pennsylvania, steel scrap grades, including No. 1 busheling, are up $1 a ton. Prices for export, dock, are also higher, with No. 1 heavy melting at $31 and No. 2 heavy melting at $27.

New York—Brokers' buying prices are unchanged on all major grades of scrap for the first time in weeks. However, in the stainless steel specialties, prices have been advanced on 18-8 borings and turnings to $85-$90; 430 sheets, clips and solids to $60-$65; and, on 410 type material to $50-$55.

Cincinnati—The market has inched upward without local buying. Prices are up 50 cents to $1.50 a ton, mainly due to outside demand. No. 1 open hearth grades advanced 50 cents, while No. 2 grades rose $1. Turnings climbed $1, borings, $1.50. Low phosphorus moved up $2, as did No. 1 railroad heavy melting. Rails, random lengths rose $1.50. The spread has widened on No. 1 cupola and drop broken machinery.

Detroit—The undertone of the scrap market is strong, but no new mill buying is reported.

Chicago—The highest steelmaking rate in 15 months notwithstanding —94 per cent of capacity—fails to install a scrap market here. For more than two weeks buying has been light and prices stable.

The Chicago Mercantile Exchange has liquidated the March contract for No. 1 heavy melting steel in futures trading.

Cleveland—Not much in the way of new buying is reported in the local scrap market. Prices are generally firm and unchanged. However, low phos material is quoted about $1 higher in the Valley. Electric furnace operation is stepping up, providing strong support to electric furnace grades.

Pittsburgh—Good scrap is not plentiful here. One producer paid $40 for a small amount of high-quality No. 1 heavy melting, but the bulk of trading remains at $38-$39. No. 2 heavy melting is in strong demand, but sales of No. 2 bundles are dropping. Railroad scrap continues to increase in price. Turnings are also strengthening. Prices are higher on stainless scrap.

Buffalo — Stronger tendencies and talk of higher prices dominate the local scrap market. Orders by the leading mill consumer at higher prices are expected shortly. Meanwhile, the price on low phos material has jumped $1.50 per ton. Market sentiment here is supported by strength at other consuming points.

Los Angeles—The upturn in scrap sales continued in February, but at a reduced rate. If March sales hold at the February level, first quarter volume will be 10 per cent above that in the like period of last year.

San Francisco—Sales of cast scrap are rising, but prices are unchanged. Steel grades are in demand for export.

Seattle—The scrap market advanced $2 per ton last week. No. 1 and No. 2 heavy melting are now quoted $31 and $27, respectively. Motor blocks are up $2 also and other items have firmed. Cast iron is not so strong as steel grades.

Tubular Goods . . .

Tubular Goods Prices, Page 168

Merchant pipe distributors are showing a disposition to build up inventories following a policy of some months of buying from hand-to-mouth. Brisk construction accounts for substantial volume.

Deliveries are becoming more extended. In New England, shipments of seamless, 5 to 10 in., have lengthened. Also, production of buttweld is heavier, though district sales quotas are still unfilled. At Pittsburgh, mechanical tubing and oil country goods are rising in volume.

Structural Shapes . . .

Structural Shape Prices, Page 164

January bookings of fabricated structural steel amounted to 239,285 tons, 22 per cent greater than in the previous month, and 61,525 tons above bookings in the corresponding month a year ago, reports the American Institute of Steel Construction.

Shipments were 218,670 tons, a drop of 2 per cent from the previous month but 31 per cent over the average January during the 1947-1949 base years. Backlog of work ahead, as of Jan. 31, was 1,346,107 tons, compared with 1,686,385 tons a year ago and the 1,237,286-ton average for the 1947-49 base period.

All signs point to active construction over the country during remainder of the year. Fabricators' backlogs are gradually becoming extended.

Rails, Cars . . .

Track Material Prices, Page 167

New life is coming into the steel rail market which has been listless. Some railroads are releasing orders earlier and want deliveries faster than schedules originally set up.

Wire . . .

Wire Prices, Pages 166 & 167

Definitely stronger demand for wire products is developing, resulting in lengthening deliveries. This applies not only to merchant items,

(*Please turn to page* 184)

JOLIET

WROUGHT

write for our new catalog of standard and special washers for all types of industrial applications.

WASHER

COMPANY

Moen & Connell Avenues
Joliet, Illinois

★

If you're trying to locate a prominent visitor to Baltimore—save time —try the Lord Baltimore first.

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Mar. 2	$37.33
Feb. 23	37.33*
Jan. Avg.	34.95
Feb. 1954	26.91
Feb. 1950	27.52

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania. *Revised

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting..	38.00-39.00
No. 2 heavy melting..	35.00-36.00
No. 1 bundles	38.00-39.00
No. 2 bundles	*29.50-30.50*
No. 1 busheling	38.00-39.00
Machine shop turnings	*20.50-21.50*
Mixed borings, turnings	*20.50-21.50*
Short shovel turnings	*24.50-25.50*
Cast iron borings	*24.50-25.50*
Cut structurals, 5 ft lengths	41.00-42.00
Heavy turnings	34.00-35.00
Punchings & plate scrap	42.00-43.00
Electric furnace bundles	*39.00-40.00*

Cast Iron Grades

No. 1 cupola	38.00-39.00
Charging box cast	33.00-33.00
Heavy breakable cast..	32.00-33.00
Unstripped motor blocks	32.00-33.00
No. 1 machinery cast..	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	*40.00-41.00*
Rails, 2-ft and under	*50.00-51.00*
Rails, 18-in. and under	*51.00-52.00*
Rails, random lengths	*46.00-47.00*
Railroad specialties	44.50-45.50

Stainless Steel Scrap

18-8 bundles & solids	*210.00-220.00*
18-8 turnings	*105.00-110.00*
430 bundles & solids	*95.00-100.00*
430 turnings	*60.00-65.00*

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting..	33.50-34.50
No. 2 heavy melting..	29.50-30.50
No. 1 bundles	33.50-34.50
No. 2 bundles	26.50-27.50
No. 1 busheling	33.50-34.50
Machine shop turnings.	17.00-18.00
Mixed borings, turnings	23.00-24.00
Short shovel turnings..	23.00-24.00
Cast iron borings	23.00-24.00
Low phos.	33.50-34.50
Cut structural plate 2 ft and under	38.50-39.50
Alloy free, short shovel turnings	25.50-26.50
Electric furnace bundles	33.50-34.50

Cast Iron Grades

No. 1 cupola	45.00-46.00
Charging box cast	36.00-37.00
Stove plate	42.00-43.00
Heavy breakable cast..	34.00-35.00
Unstripped motor blocks	29.00-30.00
Brake shoes	31.00-32.00
Clean auto cast	46.00-47.00
No. 1 wheels	43.00-44.00
Burnt cast	32.00-33.00
Drop broken machinery	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
R.R. malleable	44.00-45.00
Rails, 3-ft and under	50.00-51.00
Rails, 18-in. and under	51.00-52.00
Rails, random lengths	45.00-46.00
Cast steel	38.00-39.00
Railroad specialties	38.00-39.00
Uncut ties	40.00-41.00
Angles, splice bars	45.00-46.00
Rails, rerolling	52.00-53.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	190.00-200.00
18-8 turnings	80.00-90.00
430 clips, bundles, solids	80.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting..	37.00-38.00
No. 2 heavy melting..	32.00-33.00
No. 1 bundles	36.00-37.00
No. 2 bundles	27.50-28.50
No. 1 busheling	36.00-37.00
Machine shop turnings	18.00-19.00
Short shovel turnings	*25.00-26.00*
Cast iron borings	*25.00-26.00*
Low phos.	*37.00-38.00*
Electric furnace bundles	36.00-37.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00

CHICAGO

No. 1 heavy melting..	33.00-35.00
No. 2 heavy melting..	31.00-32.00
No. 1 factory bundles..	35.00-36.00
No. 1 dealer bundles..	33.00-34.00
No. 2 bundles	24.00-25.00
No. 1 busheling	33.00-35.00
Machine shop turnings	16.00-17.00
Mixed borings, turnings	18.00-19.00
Short shovel turnings..	18.00-19.00
Cast iron borings	18.00-19.00
Cut structurals, 3 ft	*35.00-36.00*
Punchings & plate scrap	*36.00-37.00*
Electric furnace bundles	35.00-36.00

Cast Iron Grades

No. 1 cupola	39.00-41.00
Stove plate	34.00-35.00
Unstripped motor blocks	28.00-29.00
Clean auto cast	44.00-45.00
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
R.R. malleable	44.00-45.00
Rails, 2-ft and under..	47.00-48.00
Rails, 18-in. and under	48.00-49.00
Angles, splice bars	43.00-44.00
Rails, rerolling	49.00-50.00

Stainless Steel Scrap

18-8 bundles & solids	205.00-210.00
18-8 turnings	95.00-100.00
430 bundles & solids	85.00-90.00
430 turnings	45.00-50.00

Chicago Mercantile Exchange

(Week ended Mar. 2)
No. 1 Heavy Melting

	High	Low	Close
March	36.50	36.00	36.00

Sales (40-ton Units): 3 March.

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting..	28.50
No. 2 heavy melting..	23.00
No. 1 bundles	*29.00*
No. 2 bundles	*21.00*
No. 1 busheling	*28.00*
Machine shop turnings	*13.00*
Mixed borings, turnings	*13.00*
Short shovel turnings..	17.00
Punchings & plate scrap	30.00

Cast Iron Grades

Charging box cast	27.00
No. 1 cupola	34.00
Stove plate	30.00
Heavy breakable	25.00
Unstripped motor blocks	20.00
Clean auto cast	38.00
Malleable	50.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*32.00-33.00*
No. 2 heavy melting	*28.00-29.00*
No. 1 bundles	*32.00-33.00*
No. 2 bundles	*23.00-24.00*
No. 1 busheling	*32.00-33.00*
Machine shop turnings	*17.00-18.00*
Mixed borings, turnings	*19.00-20.50*
Short shovel turnings	*20.00-21.00*
Cast iron borings	*19.50-20.50*
Low phos. 18-in.	*38.00-39.00*

Cast Iron Grades

No. 1 cupola	*39.00-40.00*
Heavy breakable cast..	35.00
Charging box cast	36.00
Drop broken machinery	*44.00-45.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*35.00-36.00*
Rails, 18-in. and under	47.00-48.00
Rails, random lengths	*41.50-42.50*

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting...	39.50
No. 2 heavy melting...	35.00
No. 1 bundles	39.50
No. 2 bundles	*31.50*
No. 1 busheling	39.50
Electric furnace bundles	41.00
Machine shop turnings.	22.50
Mixed borings, turnings	21.00
Short shovel turnings	*25.50*
Structurals & plate	*42.00-43.00*
Heavy turnings	34.00
Couplers, springs, wheels	*42.50*
Rail crops, 2 ft & under	52.00

Cast Iron Grades

No. 1 cupola	*35.00-38.00*
Malleable	44.00
Heavy breakable cast..	38.50-39.00
Drop broken machinery.	44.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting...	33.00-34.00
No. 2 heavy melting...	30.00-31.00
No. 1 bundles	33.00-34.00
No. 2 bundles	24.00-25.00
Machine shop turnings..	14.00-15.00
Mixed borings, short turnings	15.00-16.00
Short shovel turnings ..	16.00-17.00
Low phos. (structural & plate)	35.00-36.00

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	22.00-23.00

Stainless Steel

18-8 sheets, clips, solids	175.00-180.00
18-8 borings, turnings	*85.00-90.00*
430 sheets, clips, solids	*60.00-65.00*
410 sheets, clips, solids	*50.00-55.00*

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*28.00-29.00*
No. 2 heavy melting	*23.50-24.50*
No. 1 bundles	*28.00-29.00*
No. 2 bundles	*21.00-22.00*
Machine shop turnings.	11.00-12.00
Mixed borings, turnings	*12.50-13.50*
Machine shop turnings.	11.00-12.00
Short shovel turnings	*14.00-15.00*
No. 1 cast	30.00-31.00
Mixed cupola cast	28.00-29.00
No. 1 machinery cast..	33.00-34.00

BUFFALO

No. 1 heavy melting..	32.00-33.00
No. 2 heavy melting..	27.50-28.50
No. 1 bundles	32.00-33.00
No. 2 bundles	25.50-26.50
No. 1 busheling	32.00-33.00
Machine shop turnings.	19.00-20.00
Short shovel turnings.	21.50-22.50
Cast iron borings	20.50-21.50
Low phos.	35.00-36.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	36.00-37.00
No. 1 machinery	41.00-42.00

Railroad Scrap

Rails, random lengths..	35.00-36.00
Rails, 3 ft and under..	42.00-43.00
Railroad specialties	36.50-37.50

BIRMINGHAM

No. 1 heavy melting..	30.00-31.00
No. 2 heavy melting..	27.00-28.00
No. 1 bundles	30.00-31.00
No. 2 bundles	*23.00-24.00*
No. 1 busheling	*30.00-31.00*
Cast iron borings	*15.00-16.00*
Short shovel turnings	*21.00-22.00*
Machine shop turnings	*17.00-18.00*
Electric furnace bundles	32.00-33.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	45.00-46.00
Stove plate	42.00-43.00
Bar crops and plate	*36.00-37.00*
Structural plate, 2 ft	*36.00-37.00*
Unstripped motor blocks	35.50-36.50

Railroad Scrap

No. 1 R.R. heavy melt	*35.00-36.00*
Rails, 18-in. and under	42.00-43.00
Rails, rerolling	43.00-44.00
Rails, random lengths	38.00-39.00
Angles, splice bars	39.00-40.00
Stand. steel axles	35.00-36.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting..	31.00
No. 2 heavy melting..	29.00
No. 1 bundles	31.00
No. 2 bundles	24.50
Machine shop turnings	15.00
Short shovel turnings..	17.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	32.50
Heavy breakable cast..	32.50
Unstripped motor blocks	32.50
Brake shoes	32.00
Clean auto cast	42.50
Stove plate	36.50

Railroad Scrap

No. 1 R.R. heavy melt.	35.50
Rails, 18-in. and under	46.00
Rails, random lengths..	40.00-41.00
Rails, rerolling	46.00
Angles, splice bars	41.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	*31.00*
No. 2 heavy melting	*27.00*
No. 1 bundles	22.50
No. 2 bundles	20.00
No. 3 bundles	14.00
Machine shop turnings.	12.00-14.00
Mixed borings, turnings	12.00-14.00
Short shovel turnings..	12.00-14.00
Electric furnace, No. 1.	35.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	*35.00-38.00*
Heavy breakable cast...	23.00
Unstripped motor blocks	*27.00*
No. 1 wheels	21.00
Stove plate (f.o.b. plant)	28.00-29.00
Brake shoes	28.00-29.00

Railroad Scrap

(Delivered consumer plant)

Rails, random lengths..	30.00-34.00

LOS ANGELES

No. 1 heavy melting..	28.00
No. 2 heavy melting..	24.00
No. 1 bundles	27.00
No. 2 bundles	22.00
Machine shop turnings.	8.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	42.00-44.00

SAN FRANCISCO

No. 1 heavy melting..	24.00
No. 2 heavy melting..	20.00
No. 1 bundles	23.00
No. 2 bundles	18.00
No. 1 busheling	24.00
Machine shop turnings	6.00
Mixed borings, turnings	6.00
Short shovel turnings.	9.00
Cast iron borings	9.00
Cut structurals	25.00
Heavy turnings	9.00
Punchings & plate scrap	25.00
Electric furnace bundles	19.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast..	36.00
Unstripped motor blocks	36.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	48.00

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting...	32.00
No. 2 heavy melting...	29.00
No. 1 bundles	32.00
No. 2 bundles	26.00
Mixed steel scrap	26.00
Mixed borings, turnings	12.00
Rails, remelting	41.00
Busheling, new factory: Prepared	30.00
Unprepared	26.00
Short steel turnings	12.00

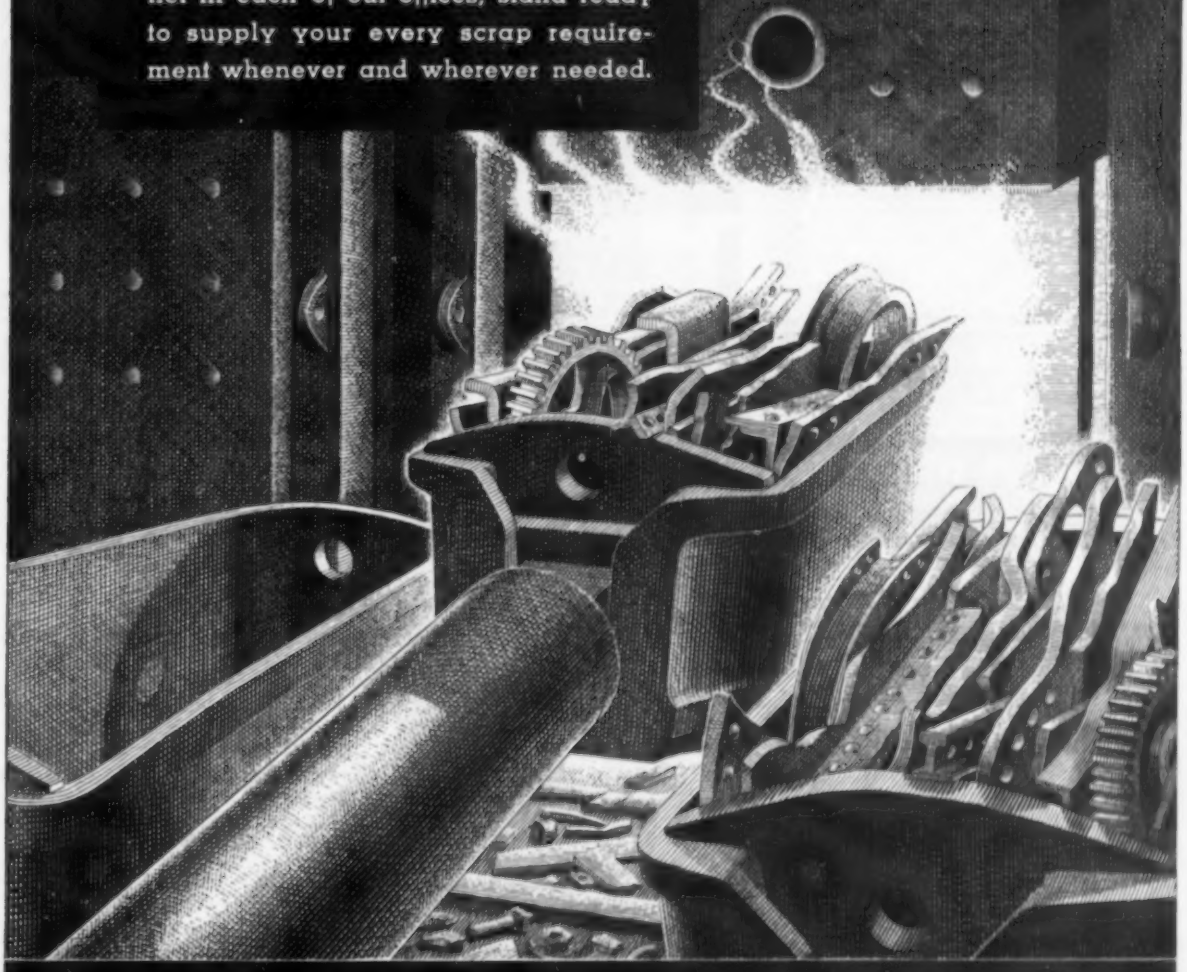
Cast Iron Grades†

No. 1 machinery cast..	42.00-45.00

†F.o.b., shipping point.

SCRAP *at your Service!*

The facilities and experienced personnel in each of our offices, stand ready to supply your every scrap requirement whenever and wherever needed.



CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

LURIA BROTHERS AND COMPANY, INC.

MAIN OFFICE
LINCOLN-LIBERTY BLDG.
Philadelphia 7, Penna.

PLANTS
LEBANON, PENNA. DETROIT (ECORSE), MICHIGAN
READING, PENNA. PITTSBURGH, PENNA.
MODENA, PENNA. ERIE, PENNA

OFFICES
BIRMINGHAM, ALA. DETROIT, MICH. PITTSBURGH, PENNA.
BOSTON, MASS. HOUSTON, TEXAS PUEBLO, COLORADO
BUFFALO, N. Y. LEBANON, PENNA. READING, PENNA.
CHICAGO, ILLINOIS LOS ANGELES, CAL. ST. LOUIS, MO.
CLEVELAND, OHIO NEW YORK, N. Y. SAN FRANCISCO, CAL.
SEATTLE, WASH.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

for Equipment that has to work in Tight Spots . . . . . Specify
WISCONSIN
HEAVY-DUTY
Air-Cooled ENGINE

The extremely compact design and relatively light weight of Wisconsin Heavy-Duty Air-Cooled Engines adapt them ideally for equipment that has to work in tight places . . . as well as for all types of service requiring heavy-duty power performance. Wisconsin features include:

Tapered roller bearings at BOTH ends of the crankshaft; an easily accessible, rotary type, high tension OUTSIDE Magneto, equipped with Impulse Coupling for easy starting at low cranking speed; pump circulated splash lubrication on smaller models and geared oil pump delivering an individual oil stream to each rod on multi-cylinder models, plus efficient AIR-COOLING at temperatures up to 140° F. In addition, Wisconsin Engines have the inherent Lugging Power that *hangs on* and keeps the job moving through the shock-load pinches.

These are some of the reasons why it will pay you to specify "WISCONSIN ENGINES" for your equipment. Write for Bulletin S-164.

This Lincoln Portable welder, made by Lincoln Electric Co., Cleveland, O., is a typical example of Wisconsin Air-Cooled Engine Power that "fits the job and the machine". The 2-cylinder Wisconsin Air-Cooled Engine weighs only 205 lbs. and delivers 15 hp. at 3000 rpm.

WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

A 8280-1A

MOTORIZED
COIL LIFTER
SAVES
STORAGE SPACE...
HANDLES COILS FASTER . . . SAFER

1 Lifter Handles Both Wide and Narrow Coils With Same Speed and Economy

This C-F Coil Lifter, under control of the Crane operator handles hundreds of coils a day in a large mill . . . wide, narrow, and of varying tonnage. Fast, infinite adjustments of the motorized legs permit quick pick-up and set-down. Legs can be opened to any width and held . . . no need to open to maximum width to handle narrow coil. Maximum of 12" required between coils of any width—saves storage room.

Positive tong grip on coil tightens as lift is made . . . insures safe handling. Made in motorized models for crane cab or pendant operation as well as manual types with chain wheel, in capacities from 3 tons up. Powered Rotating Heads available. Opening ranges to suit your requirements. Write for Bulletin and complete information.

CULLEN-FRIESTEDT CO.
1308 South Kilbourn Avenue • Chicago 23, Illinois

(*Concluded from page* 181)

seasonally more active, but manufacturers wire as well. Consumers are showing more forward interest.

Warehouse . . .

Warehouse Prices, Page 168

Warehousemen are more optimistic. February sales topped the previous month's bookings and further improvement is expected this month. Greatest gains are in sheets; bars and plates show some betterment, with some mill buyers in the market. A high ratio of plate demand is for semi-fabricated material — flame-cut or sheared to specific sizes. Spring construction items, such as wire, are moving at a faster pace.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 179

Oven foundry coke demand holds strong and is improving. March orders on sellers' books at the start of the month are well in advance of those at the beginning of last month.

Pig Iron . . .

Pig Iron Prices, Page 169

Pig iron sales continue to increase, supported by a step-up in foundry operations. An encouraging factor is wider diversification of casting demand. No foreign iron is being offered.

Domestic producers are relighting furnaces to meet the heavier demand.

Carson, Marshall & Co., Philadelphia, exclusive sales agent for Chester Furnace Inc., Chester Pa., has appointed Associated Metals & Minerals Corp., New York, to handle sales of Chester iron in New York, New England and New Jersey.

Iron Ore . . .

Iron Ore Prices, Page 179

Base prices on Lake Superior iron ore are up 10 to 20 cents per ton for the 1955 season, it was announced last week by John S. Wilbur, vice president-sales, Cleveland-Cliffs Iron Co., Cleveland. Other ore shippers are expected to take similar action. Oliver Iron Mining Division, U. S. Steel Corp., notified customers a week ago.

Cleveland-Cliffs increased Mesabi base prices 20 cents per ton, making Mesabi nonbessemer ore $10.10 and Mesabi bessemer $10.25 per gross ton at rail of vessel, lower lake ports. The company's blast furnace ore from its Marquette range mines is up 10 cents per ton, making the base $10.25 per gross ton for Marquette old range ore.

MOTORS · GENERATORS
TRANSFORMERS
NEW · REBUILT
WORLD'S LARGEST INVENTORY
ELECTRIC EQUIPMENT CO.
PHONE STATION COLLECT GL 6783
P.O. BOX 51 ROCHESTER 1, NEW YORK

THREADED Rods
10 to 12 ft. lengths
ALL METALS
Also Screw Machine Products to Order
EASTERN
Machine Screw Corp.
New Haven, Conn.
Makers of H & G Die Heads

transformers
built to your specifications
Take advantage of our more than 40 years' experience in manufacturing and re-building industrial transformers. Complete satisfaction guaranteed.
Send us your specifications for prompt quotation
"TRANSFORMER HEADQUARTERS"
Manufactured – Bought – Sold – Repaired
THE ELECTRIC SERVICE CO., INC.
5315 Hetzel St., Cincinnati 27, Ohio

RAILWAY EQUIPMENT
FOR SALE
Used — As Is — Reconditioned
RAILWAY CARS—
ALL TYPES
"SERVICE-TESTED"
FREIGHT CAR REPAIR PARTS
For All Types of Cars
LOCOMOTIVES
Diesel, Steam, Gasoline
Diesel-Electric
RAILWAY TANK CARS
STORAGE TANKS
6,000—8,000 and 10,000-Gallon
Cleaned and Tested
CRANES
Overhead and Locomotive
RAILS
New or Relaying
IRON & STEEL PRODUCTS, INC.
General Office
13462 S. Brainard Ave.
Chicago 33, Illinois
Phone: Mitchell 6-1212
New York Office
50-d Church Street
New York 7, New York
Phone: BEekman 3-8230
"*ANYTHING* containing IRON or STEEL"

CLASSIFIED

Accounts Wanted

ADDITIONAL EQUIPMENT LINES for industrial and power plant use wanted by manufacturers' representative for eastern half of Pennsylvania, southern half of New Jersey, and state of Delaware. Reply Box 221, STEEL, Penton Building, Cleveland 13, Ohio.

Representatives Wanted

REPRESENTATIVES WANTED to sell PRECISION SPRINGS on commission basis. Top quality and excellent deliveries. All territories open. Complete information furnished upon request. Reply Box 222, STEEL, Penton Building, Cleveland 13, Ohio.

Employment Service

SALARIED POSITIONS $5,000 to $35,000. We offer the original personal employment service (established 45 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W. BIXBY, INC., 665 Brisbane Bldg., Buffalo 3, N.Y.

FOR SALE

1—Broden Down Coiler—will coil any size steel up to 6000#, .060" thick up to .187" thick, 28¾" max. width.

1—Broden Down Coiler—will coil steel .032" thick up to .156" thick, any width up to 18". Can be readily converted to 24" width.

1—20" x 96" Landis Roll Grinder.

Reply Box 223, STEEL
Penton Building Cleveland 13, Ohio

FOR SALE

ANNEALING FURNACE—5' 7½" x 63' 0" inside refractories, completely equipped with burners, blowers and controllers.

WEST VIRGINIA STEEL & MFG. CO.
P. O. Box 118
Huntington 6, West Virginia

BEFORE YOU BUY OR RENT
Consult
INDUSTRIAL RENTING CORP.
Rent all the machine tools you need from ONE SOURCE with terms designed to meet YOUR needs.
Our rates are as low as or lower than those offered by the government! Write for Brochure.
INDUSTRIAL RENTING CORP.
132 54 St. Bklyn, N.Y. HY 2-6563

ATTENTION ENGINEERS

NEW ENGLAND STEEL MILL REQUIRES FOR IMMEDIATE EMPLOYMENT QUALIFIED DESIGN ENGINEERS AND DRAFTSMEN FOR FOUNDATIONS, STRUCTURAL AND MECHANICAL DEVELOPMENTS.

PLEASE SUBMIT RESUME OF EXPERIENCE, EDUCATION, AND PERSONAL DATA, TOGETHER WITH SALARY REQUIREMENTS TO:

BOX 224, STEEL
PENTON BUILDING CLEVELAND 13, O.

UNDISPLAYED CLASSIFIED RATES

ALL CLASSIFICATIONS

Other than "Positions Wanted"

	Set Solid	All Capitals	All Caps Leaded
50 words or less	$15.00	$19.20	$23.40
Each additional word	.30	.38	.47

POSITIONS WANTED

25 words or less	$ 3.60	$ 4.50	$ 5.40
Each additional word	.14	.18	.22

Cash with order necessary on "Positions Wanted"

Keyed address takes seven words. Replies forwarded without charge.

All classified pages are 3 columns, each column 2¼".

Forms close 10 days prior to publication date.

STEEL *The Weekly Magazine of Metalworking*
Penton Building, Cleveland 13, Ohio

WANTED

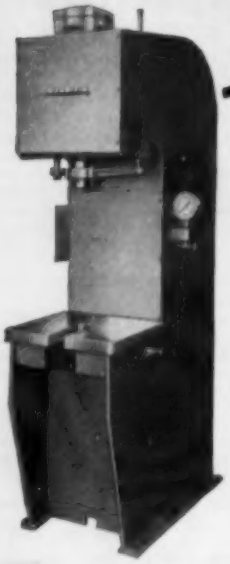
MILL SUPERINTENDENT

LONG ESTABLISHED AND AGGRESSIVE MIDWESTERN STEEL MILL HAS EXCEPTIONAL OPPORTUNITY FOR BAR MILL SUPERINTENDENT. WIDE AND VARIED EXPERIENCE IN ROLLING CARBON, ALLOY, STAINLESS NECESSARY.

— FOR INTERVIEW —
Send Details To:
BOX 220, STEEL
PENTON BUILDING CLEVELAND 13, OHIO

PRICE LIST

ON HANNIFIN STOCK HYDRAULIC PRESSES



1-TON	$ 552
2-TON	$ 627
5-TON	$1,286
8-TON	$1,581
10-TON	$1,855
25-TON	$3,681

Prices complete with motors and starters F.O.B. our press plant, St. Marys, Ohio, subject to change without notice.

DELIVERY FROM STOCK

Demand for these popular presses is so consistent we are able to produce them in quantity and pass the savings along to you.

Construction-wise and quality-wise these small general-purpose presses are identical to the larger Hannifin presses, up to 150 tons. Special, optional controls when needed.

WRITE for complete information on the Hannifin Hydraulic Press you're interested in.

HANNIFIN

HANNIFIN CORPORATION, 523 S. WOLF ROAD, DES PLAINES, ILLINOIS

We're proud of the thousands of satisfied customers, large and small, who continue to call on us again and again.

These companies know the advantages of buying from a "full line" manufacturer. They also recognize the resourcefulness of our engineering staff. And . . . perhaps most important . . . they appreciate the integrity and reliability on which The E. W. Buschman Company has been built.

Contact Buschman the next time you have a materials handling problem . . . or write today for catalog.

Complete Conveyor Systems For All Types Of Industries
Engineered . . . Manufactured . . . Installed

Buschman Conveyors
REPRESENTATIVES IN PRINCIPAL CITIES

THE E. W. BUSCHMAN COMPANY
4496 CLIFTON AVE. • CINCINNATI 32, OHIO

C-6000-EWB

Advertising Index

Ajax Engineering Corporation	26
Alan Wood Steel Co.	68
Allied Chemical & Dye Corporation, General Chemical Division	140
Allied Research Products, Inc.	132
Allis-Chalmers	130
Alloy Metal Wire Division, H. K. Porter Company, Inc.	148
Alter Co., Alloy Metal Division	177
American Steel Foundries, Elmes Engineering Division	40
American Wheelabrator & Equipment Corporation	161
Armco Steel Corporation	55
Arwood Precision Casting Corporation	49
Associated Spring Corporation	145
Atlantic Refining Co., The	19
Austenal Laboratories, Inc., Microcast Division	12
Babcock & Wilcox Co., The, Tubular Products Division	Inside Front Cover
Barnes-Gibson-Raymond, Division of Associated Spring Corporation	145
Barnes, Wallace, Co., Division of Associated Spring Corporation	145
Barnes, Wallace Co., The, Ltd., Division of Associated Spring Corporation	145
Beatty Machine & Mfg. Co.	94
Bethlehem Steel Co.	1
B-G-R Cook Plant, Division of Associated Spring Corporation	145
Bixby, E. W., Inc.	185
Blaw-Knox Co., Union Steel Castings Division	39
Bliss & Laughlin, Inc.	27
Bliss, E. W., Co.	113
Brad Foote Gear Works, Inc.	153
Bullard Co., The	128
Bundy Tubing Co.	45
Buschman, E. W., Co., The	186
Chandeysson Electric Co.	135
Chase Brass & Copper Co.	95
Chicago Steel Service Co.	97
Cincinnati Shaper Co., The	17
Cleveland Electric Illuminating Co., The	116, 117
Cleveland Metal Abrasive Co., The	175
Cleveland Steel Tool Co., The	180
Colorado Fuel & Iron Corporation, The, Wickwire Spencer Steel Division	85
Columbia-Geneva Steel Division, United States Steel Corporation	41
Continental Industrial Engineers, Inc.	146
Coolidge Corporation	79
Crucible Steel Casting Co.	172
Crucible Steel Company of America	86
Cullen-Friestedt Co.	184
Danly Machine Specialties, Inc.	88, 89
Delpark Corporation	31
Detrex Corporation	147
Detroit Stamping Co.	78
Diamond Mfg. Co.	180
Dunbar Brothers Co., Division of Associated Spring Corporation	145
Duraloy Co., The	163
Eastern Machine Screw Corporation, The	180, 185
Eaton Manufacturing Co., Dynamatic Division	22
Electric Controller & Mfg. Co., The	56
Electric Equipment Co.	185
Electric Service Co., Inc., The	185
Elgin National Watch Co., Abrasives Division	180
Elmes Engineering Division, American Steel Foundries	40
Erie Foundry Co.	133
Ex-Cell-O Corporation	4, 5
Farrel-Birmingham Co., Inc.	114
Farval Corporation, The	Inside Back Cover
Fellows Gear Shaper Co., The	92
Ferry Cap & Set Screw Co., The	38
Firth Sterling, Inc.	125
Florida, State of, Industrial Development Division	154
French & Hecht Division, Kelsey-Hayes Wheel Co.	172
Garlock Packing Co., The	98

General Chemical Division, Allied Chemical & Dye Corporation 140
Gibson, William D., Co., The, Division of Associated Spring Corporation 145
Gisholt Machine Co. 13
Gould-National Batteries, Inc. 51
Gray Iron Founders' Society 36
Green, A. P., Fire Brick Co. 139

Handy & Harman 96
Hannifin Corporation 186
Hansen Manufacturing Co., The 155
Harvey Aluminum Sales, Inc. 159
Haynes Stellite Co., A Division of Union Carbide & Carbon Corporation 47
Hevi Duty Electric Co. 173
Hobart Brothers Co. 3
Hough, Frank G., Co., The 11
Hyatt Bearings Division, General Motors Corporation 72

Industrial Filtration Co. 31
Industrial Gauges Corporation 156
Industrial Products Suppliers 178
Industrial Renting Corporation 185
International Nickel Co., Inc., The 52
Iron & Steel Products, Inc. 185
Ironsides Co., The 34

Joliet Wrought Washer Co. 181
Jomac, Inc. 87
Jones & Lamson Machine Co., Machine Tool Division 8, 9
Jones & Laughlin Steel Corporation 130, 131

Kaiser Aluminum & Chemical Sales, Inc., Kaiser Chemicals Division 170
Kaiser Steel Corporation 30
Kelsey-Hayes Wheel Co., French & Hecht Division 172
Kinnear Mfg. Co., The 126

Laclede-Christy Co., Division of H. K. Porter Company, Inc. 150
Laminated Shim Co., Inc., Stampings Division 122
Lapointe Machine Tool Co., The 100
Lawthwaite, T. H., Machine Co., Inc. 180
Lincoln Electric Co., The 179
Linde Air Products Co., A Division of Union Carbide & Carbon Corporation 32
Lord Baltimore Hotel 181
Luria Brothers & Co., Inc. 183

Magnaflux Corporation 109
Manheim Manufacturing & Belting Co. 48
Manross, F. N., & Sons Co., Division of Associated Spring Corporation 145
Mattison Machine Works 44
Merit Products, Inc. 6
Metal Blast, Inc. 46
Micro Switch, A Division of Minneapolis-Honeywell Regulator Co. 24
Milwaukee Division of Associated Spring Corporation 145
Minneapolis-Honeywell Regulator Co., Industrial Division 42
Minneapolis-Honeywell Regulator Co., Micro Switch Division 24
Monsanto Chemical Co., Organic Chemicals Division 28
Morgan Construction Co. 67
Morse Twist Drill & Machine Co. 14, 15
Mundt, Charles, & Sons 187

National Malleable & Steel Castings Co. 118
National Roll & Foundry Co., The 50
National Steel Corporation 25
Naugatuck Chemical Division of United States Rubber Co. 127
New Departure, Division of General Motors 75
Newport Steel Corporation 23
Niagara Blower Co. 144
Northern Engineering Works 142

Ohio Division of Associated Spring Corporation 145
Ohio Steel Foundry Co., The 80
Owen Bucket Co., The 180

Peterson Steels, Inc. 90
Phillips Petroleum Co. 2
Poole Foundry & Machine Co. 172
Porter, H. K., Company, Inc., Alloy Metal Wire Division 148
Porter, H. K., Company, Inc., Laclede-Christy Co. Division 150

Raymond Manufacturing Co., Division of Associated Spring Corporation 145
Ren-ite Plastics, Inc. 178
Republic Steel Corporation 20, 21
Rockford Machine Tool Co. 29
Roebling's, John A., Sons Corporation, A Subsidiary of The Colorado Fuel & Iron Corporation 99
Rollway Bearing Co., Inc. 151

Sandusky Foundry & Machine Co. 141
Sandvik Steel, Inc. 136
Sciaky Bros., Inc. 7
Seaboard Coil Spring Division of Associated Spring Corporation 145
Sealmaster Bearings, A Division of Stephens-Adamson Mfg. Co. 37
Service Machine Co., Inc. 172
Service Steel 180
Silent Hoist & Crane Co. 174
Simmons Machine Tool Corporation 174
Stamco, Inc. 180
Standard Pressed Steel Co. 18
Standard Tube Co., The 93
Stephens-Adamson Mfg. Co., Sealmaster Bearings Division 37
Superior Tube Co. 83

Tempil Corporation 122
Tennessee Coal & Iron Division, United States Steel Corporation 41
Timken Roller Bearing Co., The, Steel & Tube Division 76
Torrington Co., The, Swager Department 188

Udylite Corporation, The 10
Union Carbide & Carbon Corporation, Haynes Stellite Co. 47
Union Carbide & Carbon Corporation, Linde Air Products Co. 32
Union Steel Castings Division, Blaw-Knox Co. 39
Unit Crane & Shovel Corporation 149
United Engineering & Foundry Co. 33
United States Rubber Co. 152
United States Rubber Co., Mechanical Goods Division 91
United States Rubber Co., Naugatuck Chemical Division 127
United States Steel Corporation, Subsidiaries 41
United States Steel Export Co. 41
United States Steel Supply Division, United States Steel Corporation 41

Vaughn Machinery Co., The 119
Victor Equipment Co. 123
Victor Saw Works, Inc. 16

Wallingford Steel Co., The 138
Waterbury-Farrel Foundry & Machine Co. 143
Wean Engineering Co., Inc., The Back Cover
Weirton Steel Co. 25
Whistler, S. B., & Sons, Inc. 134
Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corporation 85
Williams-White & Co. 111
Wisconsin Motor Corporation 184
Worcester Stamped Metal Co. 178
Wrought Washer Mfg. Co. 58

Yoder Co., The 35
Youngstown Sheet & Tube Co., The 43

Table of Contents, Page 5

Classified Advertising, Page 185

MUNDT

PERFORATED METAL MEANS PERFECT SCREENS

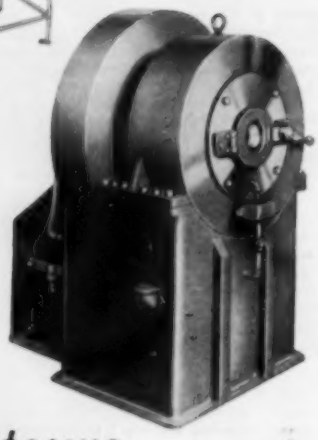
Specially Fabricated for ALL INDUSTRIES BY

CHARLES MUNDT & SONS

53 FAIRMOUNT AVE.
JERSEY CITY 4, N. J.
PHONE DELAWARE 3-6200

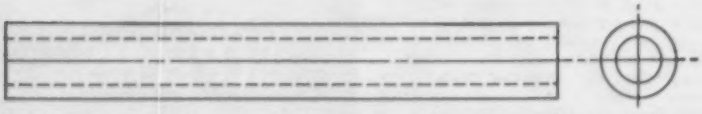
Send for Illustrated Catalog

Swaging Success Stories

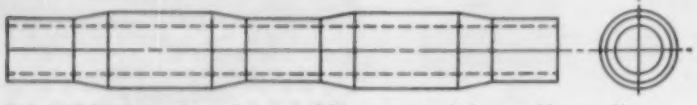


Inside Diameter Contours ... Easily Produced by Swaging

Machining multiple-diameter contours on the inside of cylindrical pieces (Fig. 1) is a difficult, time-consuming job.



Torrington's Swager experts start with tube of larger OD (Fig. 2) and machine the blanks to predetermined outside shape (Fig. 3).



Simply by swaging the outside to a straight, uniform diameter, the intricate contours are transferred to the inside (Fig. 4). Result: a sizeable saving in machining costs.

Swaging Advantages...

No Chips...No Waste...No Scrap

Swaging reduces metal—saves material—does not cut it away wastefully.

Swaging work hardens metal—gives it added strength, better finish and resiliency, dimensional accuracy.

Swaging is fast—can be done by unskilled workers to produce more pieces at lower cost.

Write for our informative booklet on Swaging that gives detailed descriptions of Torrington Rotary Swagers. It may show you how to achieve new savings in your own plant.

THE TORRINGTON COMPANY
Swager Department
150 North Street, Torrington, Conn.
Makers of Torrington Needle Bearings

TORRINGTON ROTARY SWAGING MACHINES

Taconite pelletizing plant reduces wear on open gears with Spray Valve lubrication

FARVAL—
Studies in Centralized Lubrication
No. 162

THESE photographs show how a Farval Centralized System of Lubrication uses Spray Valves to grease open gear surfaces. They are installed on a travelling grate at a new Allis-Chalmers' Ore Pelletizing Plant.

In the two years that Farval has operated at this pilot plant, it has practically eliminated wear on the gears by keeping the teeth covered at *all* times by a film of protective lubricant.

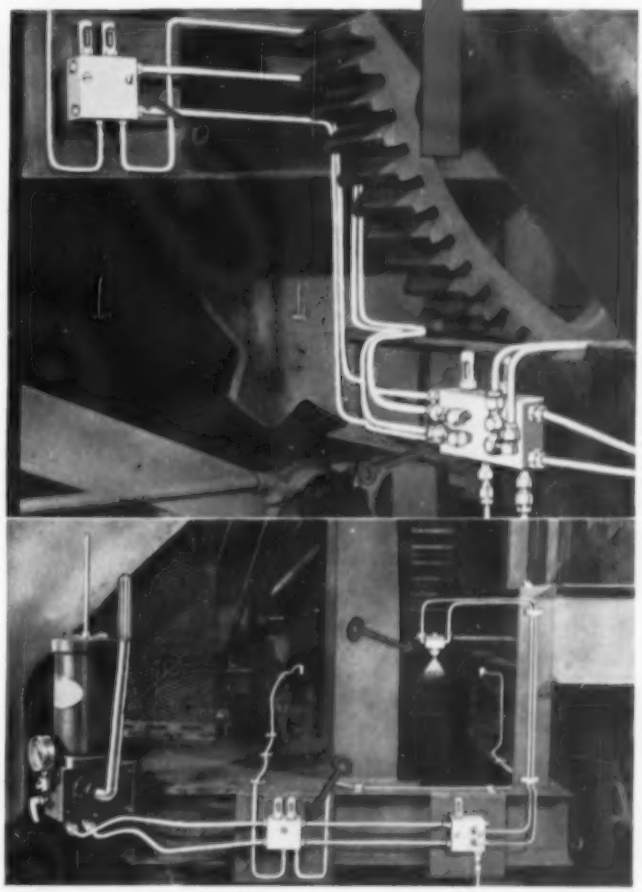
With Farval Spray Valves, oil or grease can be sprayed evenly over any number of open surfaces from one central station in exact quantities as often as desired. Just a few quick strokes of a hand pump (shown at left in lower photo) and the *complete* lubricating job is done! It's safe and easy and saves hundreds of man hours.

You can install Farval Spray Valves wherever compressed air is available. The record shows that Farval saves 95% of the quantity of lubricant used by other methods. Furthermore, by metering the exact amount of lubricant needed, Farval eliminates the hazards to safety always present when grease is slapped on by paddle or by other inefficient hand methods.

Free Lubrication Survey

If you have open gearing that is being lubricated by hand, why not have a Farval engineer inspect your equipment? Without obligation, he will present a written analysis of what Farval Spray Valves can do for you. Write also for Bulletin 26 for the complete Farval story. The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

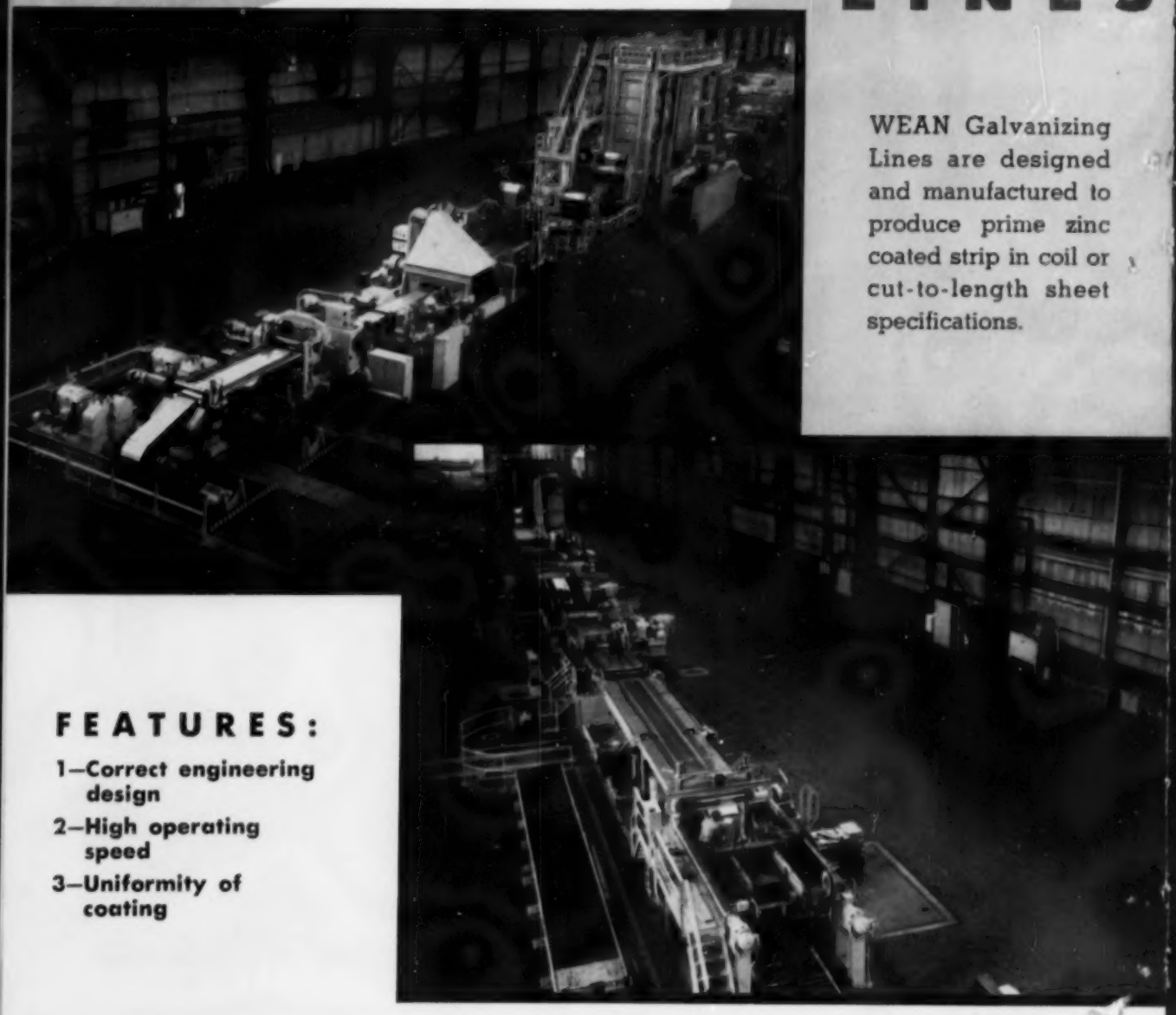
Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.



KEYS TO ADEQUATE LUBRICATION—Wherever you see the sign of Farval—the familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated. Farval manually operated and automatic systems protect millions of industrial bearings.

Top photo—Farval grease distributing lines and valve manifolds. Below—Farval hand pump, distributing lines and spray valve. Installed on travelling grate at Allis-Chalmers' Pelletizing Plant in which taconite ores are processed.

WEAN GALVANIZING LINES



WEAN Galvanizing Lines are designed and manufactured to produce prime zinc coated strip in coil or cut-to-length sheet specifications.

FEATURES:

1—Correct engineering design

2—High operating speed

3—Uniformity of coating

Specialists
IN SHEET, TIN and STRIP MILL EQUIPMENT

The **WEAN** ENGINEERING CO., Inc.
WARREN, OHIO